

**STAFF ASSESSMENT OF APPLICATION FOR 401 WATER QUALITY CERTIFICATION
FEDERAL ENERGY REGULATORY COMMISSION (FERC)**

**SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (SCDHEC)
DIVISION OF WATER QUALITY
WATER QUALITY CERTIFICATION AND WETLANDS SECTION**

1. Background Information

Applicant: South Carolina Electric & Gas Co. (SCE&G)

P/N Number: FERC 516-459 (2009)

P/N Date: October 26, 2009 **P/N Close:** December 28, 2009

Date application for 401 Water Quality Certification received: September 29, 2009

Section of Applicable Federal Law: (x) Federal Energy Regulatory Commission (FERC)
() Section 10 Permit
() Section 404 Permit

Section of Applicable State Law : (x) Section 401 Water Quality Certification (WQC)
() Coastal Zone Consistency Permit
() Critical Area Permit
() Permit for Construction in Navigable Waters

Brief Explanation of activity:

The proposed work consists of continued operation of the Saluda Hydroelectric Project (SHP), with operations modified to be consistent with SCE&G's FERC License application and the Comprehensive Relicensing Settlement Agreement (CRSA) under a new FERC License. The WQC application, a supplemental information package (SIP), the CRSA and other information is available on the web at: <http://www.scdhec.gov/environment/water/salferc401.htm> .

Throughout the relicensing of the Saluda Hydroelectric Project, South Carolina Electric & Gas Company (SCE&G) incorporated public participation at all levels. SCE&G consulted with numerous state and federal resource agencies, non-governmental organizations and interested stakeholders through a collaborative relicensing process. Resource Conservation Groups (RCG)'s were established to discuss the method and scope of the studies necessary for the Saluda Project relicensing, as well as to develop resolutions and agreements on relicensing issues. The resource groups were separated by genre, and in-depth issue discussions were limited to those that had a Project nexus, although during CRSA development, SCE&G did consider areas outside the influence of the Project in order to facilitate settlement. The seven main RCG's consisted of: Operations, Fish and Wildlife, Cultural Resources, Water Quality, Lake and Land Management, Recreation, and Safety. These seven main RCG groups were further broken down into smaller Technical Working Committees (TWC's) during relicensing. The TWC's consisted of fewer individuals who were considered knowledgeable on the specific topic the TWC was formed to discuss. The TWC members would work on the specifics of study plans, iron out scientific dilemmas, and discuss the best resolutions to issues. The TWC decisions would then be brought back to the RCG for review. A few of the various TWC's during the relicensing were: Downstream Flows TWC, Diadromous Fish TWC, Instream Flows/Aquatic Habitat TWC, Mussels & Invertebrates TWC, Lake Levels TWC, Navigational Aids TWC, Recreation Management TWC, and the Safety Program TWC, among others. A total of approximately 20 TWC's were formed.

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The CRSA was signed by 19 parties who had been involved in the relicensing process. SCDHEC and 9 other stakeholders participated in the development of the CRSA but are not signatories:

Signatories to the Settlement Agreement

American Rivers
American Whitewater
Capitol City Lake Murray Country
Catawba Indian Nation
City of Columbia Parks and Recreation
City of Columbia Fire and Rescue
Coastal Conservation League
Lake Murray Association
Lake Murray Docks
Lake Murray Homeowners Coalition
Lake Murray Power Squadron
Lake Watch
Lake Murray Chamber of Commerce
Midlands Striper Club
Riverbanks Zoo
South Carolina Department of Natural Resources
South Carolina Electric and Gas Company
South Carolina Wildlife Federation
South Carolina Department of Archives and History

Among other things, the CSRA presents issue resolutions representing consensus achieved among settling parties. The resolutions presented within the CRSA, have been proposed for consideration by the FERC, as it develops terms for the new license.

The CRSA addresses operational changes at the project and program measures designed to reduce impacts to environmental resources and to protect and enhance terrestrial and aquatic resources contained within the SHP boundary and area of influence. Issues resolved in accordance with the provisions included in the CRSA fall into the following principal areas of concern: Safety, Recreation, Fish and Wildlife, Water Quality, Operations, Lake and Land Management, and Cultural Resources. The signatories also came to agreement on several "off-license" provisions involving Wildlife Management Areas, Safety and Outreach Programs, and Shoreline Management Permitting Programs. The CRSA includes proposed FERC license articles, general terms, attachments/appendices, and supporting documentation. The scope of this review is limited to the attainment/maintenance of Water Classification & Standards (R.61-68) and Classified Waters (R.61-69) as they address water quality and aquatic resources pursuant to Water Quality Certification (R. 61-101).

Waterbody Names: Lake Murray / Lower Saluda River

Water Classifications: Freshwaters (FW) / Trout Put Grow and Take (TPGT)

Waterbody Location: Lake Murray and the Lower Saluda River in Richland, Lexington, Saluda, and Newberry Counties, South Carolina

Waterbody on 2010 303(d) List or Total Maximum Daily Load (TMDL) developed? Yes (x) No ()

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SCDHEC Monitoring Stations in the vicinity of the SHP on the 2010 303(d) List.

WATERBODY	STATION ID	COUNTY	USE*	CAUSE*
Lake Murray	S-309	Newberry	AL	CHLA, TP
Lake Murray	S-212	Newberry	AL	pH
Lake Murray	S-222	Saluda	AL	pH, TP
Lake Murray	CL-083	Lexington	AL	CU
Lower Saluda River	S-298	Lexington	REC	FC
Lower Saluda River	S-152	Lexington	FISH	HG
Lower Saluda River	S-149	Lexington	AL	TURB
*LEGEND				
<u>USE: Use support impairment for aquatic life and/or recreational uses.</u>				
AL: Aquatic Life Use				
REC: Recreational Use (Swimming)				
FISH: Fish Consumption				
<u>CAUSE: Parameter(s) that resulted in impaired use denoted as follows:</u>				
CHLA: Chlorophyll A				
HG: Mercury				
CU: Copper				
TP: Total Phosphorus				
PH: Hydrogen Ion Concentration				
TURB: Turbidity				
FC: Fecal Coliform Bacteria				

Discharges from SHP development (i.e. from the dam/powerhouse) have historically shown excursions of the state Dissolved Oxygen (D.O.) water quality standard, resulting in aquatic life impairment in the Lower Saluda River during warmer months. However, due to improved turbine venting efficiencies, the Lower Saluda River is no longer listed as impaired due to D.O. excursions, although they do still occur occasionally. Other water quality impairments in Lake Murray and the Lower Saluda River do not result from project operations (see discussion in Section 4.2 "Water Quality").

2. Project Description

Saluda Hydro is an existing licensed hydroelectric project, owned and operated by SCE&G. The Project is located on the Saluda River, in the counties of Lexington, Richland, Newberry and Saluda, South Carolina. The FERC Project Boundary extends near Silverstreet in Newberry County and downriver from the Saluda Dam to Millrace rapids on the Lower Saluda River (LSR).

The Project consists of a 7,800 ft. long earth fill embankment Dam ("Saluda Dam") 213 feet high and impounding a 48,000 acre reservoir (at elevation 358' Plant Datum (PD), a gated emergency spillway with six Tainter gates, a combination roller compacted concrete ("RCC") and rock fill back-up dam ("Backup Dam"), a powerhouse, five concrete intake towers and associated penstocks. The total rated generator capacity for the station is 207.3 MW. Further, at optimum gate openings, the hydraulic capacity of each of the Units 1 to 4 is 3,000 cubic feet per second ("CFS"), and for Unit No. 5 is 6,000 CFS, yielding a total station hydraulic capacity of 18,000 CFS. The Backup dam is also 213 feet high, with a RCC gravity section located between two rock fill embankment sections, approximately 2,300 feet long, and rock fill berm sections on the north and south ends having a combined length of approximately 5,700 feet, for a total Backup dam length of approximately 8,000 feet. Construction of the Project was completed in 1930, and

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construction of the Backup Dam was completed in 2005.

Lake Murray, the project impoundment, covers a normal maximum operating water surface area of 75 square miles or approximately 48,000 acres. The normal maximum operating water surface elevation is 356.5' North American Vertical Datum 1988 (NAVD88) during the summer months, although the current license permits a maximum operating level (full pool) of El. 358.5' NAVD88. At full pool, the reservoir is 41 miles long and about 14 miles wide at its widest point, with 691 miles of shoreline, including islands. Water surface area at full pool is 79.5 square miles or approximately 50,900 acres, with total or gross storage of approximately 2,000,000 acre-feet (650 billion gallons) of water. Usable storage is approximately 635,000 acre-feet (207 billion gallons) of water between full pool and El. 343.5', corresponding to the minimum operating level as observed under the current license. The reservoir shoreline is irregular, due to many creek beds and drainage ways cut through the terrain. Inflow is generally cooler than the reservoir water, but often carries high sediment loads. The reservoir undergoes thermal stratification annually, typically July through November, with the thermocline occurring between 20 and 40 feet deep.

2.1 What is the purpose of the proposed activity?

Saluda Hydro is operated primarily as a reserve generation facility in SCE&G's system. The plant normally operates with one unit on line at minimum gate to provide downstream flow in the Lower Saluda River. In the event of a loss of generation in the SCE&G system, the remaining Project units can be started and brought to full load within 15 minutes. This allows a rapid response to emergencies on the Company's system, and also fulfills SCE&G's reserve share obligation as a member of the Virginia-Carolinas Electric Reliability Council under its Reserve Sharing Arrangement. It should be noted that, in order to be considered a reserve generation asset at any given time, Saluda Hydro units must remain on standby and cannot be providing generation for other purposes. To the extent they are providing generation, that generation is subtracted from the reserve capacity that otherwise could be counted towards the Applicant's reserve capacity obligations. For example, were Saluda generating at 60 megawatt (MW) for a scheduled recreation flow, SCE&G could only count 147 MW of Saluda's net generating capacity towards its reserve obligation (207 total net generating capacity minus 60 MW already being generated). So, while it is generating for other reasons, SCE&G is required to make provisions to replace whatever generation that reduces the remaining, unused capacity below its reserve obligation capacity level. Failure to maintain full reserve capacity availability renders SCE&G subject to significant regulatory and contract penalties.

1. Are there public benefits? Yes (x) No ()

2.2 Fill

1. Is fill required? Yes () Total Amount: N/A No (x)
Amount in wetlands: N/A
Amount in open waters of U.S.: N/A

2. Is the fill temporary? Yes () No () N/A (x)

2.3 Excavation

1. Is excavation required? Yes () Total Amount: N/A No (x)
Amount in wetlands: N/A
Amount in open waters of U.S.: N/A

2. Type of excavation: Mechanical () Hydraulic () Other () N/A (x)

3. Is excavated material expected to contain contaminants?

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Yes () No () N/A (x)

4. Location of Disposal Site: Upland () Confined () Other () N/A (x)

5. Size of Disposal Area

Is this size adequate for amount of material to be disposed of? Yes () No () N/A (x)

6. Is this for ten year maintenance excavation/dredging? Yes () No () N/A (x)

2.4 Other Wetland Impacts: Mechanically cleared wetlands: N/A
Flooding wetlands: N/A
Other - explain:

2.5 Wetland Types

In March 2000, the SCE&G staff delineated riverine wetlands in 31 different locations immediately downstream of the Project dam comprising approximately 55 acres within the Project boundary. The hydrology of these areas varies from an intermittent or seasonal inundation to perennial flow. These are the only wetlands downstream of the Project dam to be delineated. Wetlands upstream of the Project dam, specifically those around the Lake Murray shoreline, consist primarily of lacustrine fringe communities and submerged aquatic vegetation (SAV). Approximately 363 acres of emergent wetland exist below the 358.5' contour NAVD88 (360' Plant Datum) around the lake, with nearly 90% of them occurring in the headwater region of the lake along the Saluda River. Much of the lands in the upper region of Lake Murray are classified in a protected category, as well as the majority of SCE&G owned lands bordering the LSR, and no new construction is required as part of continued operation of the Project. Therefore, no impacts to wetland communities will occur.

2.6 Project Modification

1. Was the project modified from the original public notice?
Yes () No (x) N/A ()

2. What was acreage difference between the original and the modified proposals? N/A (x)

2.7 Mitigation

1. Did the applicant propose mitigation for wetlands losses upfront?
Yes () No () N/A (x)

2. Is mitigation required by DHEC? Yes (x) No () N/A ()

Although there are no wetlands impacts associated with continued operation of the SHP, the applicant has calculated fish mortality associated with entrainment during project operations. SCE&G will continue to utilize the existing hydroacoustic equipment affixed to the Project intakes to minimize large fish entrainment events as much as possible.

3. Type of Mitigation Required:

To address turbine induced fish entrainment, SCE&G developed, in agreement with SCDNR, a plan that mitigates for this unavoidable impact. Should SCDNR determine the need to investigate a fish kill and SCE&G is found responsible for the fish kill, SCE&G has agreed to reimburse the

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State for its time to investigate the fish kill and monetarily compensate SCDNR for the cost of those fish killed.

2.8 Remediation

1. Is remediation required? Yes () No () N/A (x)

2.9 Nonpoint Source Concerns

1. Are water quality impacts from nonpoint sources expected? Yes () No (x)

Although nonpoint sources in the watershed do impact water quality in the reservoir, their introduction does not result from project operations (see Section Section 4.2 "Water Quality").

2. Has the applicant addressed nonpoint source concerns? Yes () No () N/A (x)

3. Environmental Assessment

- 3.1 Is the proposed activity water dependent?** Yes (x) No ()

- 3.2 Are there feasible alternatives to the proposed activity, which reduce adverse consequences on water quality and classified uses? If yes, explain. If no, were they investigated?** Yes () No (x)

The No Action Alternative would maintain the existing facilities and operations and is the baseline to compare with the proposed alternative, as represented in the Comprehensive Relicensing Settlement Agreement (CRSA), and all other action alternatives.

The Proposed Action Alternative represents project operational changes that will enhance water quality and classified uses. These changes represent the culmination of operational alternatives considered during the collaborative relicensing process, which resulted in the CSRA. The proposed operation of the SHP, including adaptive management strategies, will best meet the project purpose while enhancing aquatic resources and existing uses in the project area (see following Sections).

Alternatives Considered but Eliminated from further Analysis did not meet the project purpose and need, were not reasonable and did not provide the water quality and aquatic resource enhancements that would result from the Proposed Action Alternative. These alternatives include issuing a Non-power license, Federal government takeover of the Project and retiring the Project.

- 3.3 Will the proposed activity adversely affect a public water supply?** Yes () No (x)

Four municipal water intakes have been constructed in the reservoir to date to serve the cities of Columbia, West Columbia, Newberry, and Newberry County. Saluda County was granted approval for a municipal water withdrawal by FERC order dated June 9, 2006 (revised by FERC order dated March 22, 2007). Proposed lake levels will assure that water is available for these municipalities and counties.

- 3.4 Will the proposed activity adversely affect any existing water uses?** Yes () No (x)

- 3.5 Are additional aquatic impacts expected?** Yes () No (x)

- 3.6 Protection of Rare, Threatened and Endangered Species (CRSA Appendix A-9)**

To address requests made during the relicensing process concerning rare, threatened and endangered species (RT&E), SCE&G formed a RT&E Species technical working committee (TWC), which included representatives from the US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), SC Department of Natural Resources (SCDNR), non-governmental organizations (NGOs), and other stakeholders. With oversight from the RT&E TWC, the Saluda Hydro Project Rare, Threatened and Endangered Species Assessment (Kleinschmidt, 2008) was developed to provide the requested information regarding status of RT&E species in the Project vicinity, as well as potential Project-related impacts. The assessment identified three species of conservation concern as having been documented within or in close proximity to the Project: rocky shoals spider lily (*Hymenocallis coronaria*), bald eagle (*Haliaeetus leucocephalus*), and wood stork (*Mycteria americana*). State and federal resource agency staff, as well as other RT&E TWC participants, subsequently requested that management plans be prepared for these species. To address this, the RT&E Species Management Program was developed in consultation with the TWC and filed as an appendix to the CRSA. Management regimes for aquatic species are included within the plan and include such strategies as annual coordination with SCDNR and USFWS for assistance in rocky shoals spider lily restoration efforts. To provide for a public outreach component of the RT&E programs, SCE&G worked with the TWC to develop an educational brochure describing the Rare Plant and Animal Species of Interest Around Lake Murray and the Lower Saluda River. This brochure was included as a component of the CRSA and will be issued within two years after the issuance of the new license.

3.6.1 Sturgeon Protection and Adaptive Management Program (CRSA Appendix A-6)

In addition to the RT&E Species Management Program, SCE&G worked to develop a Sturgeon Protection and Adaptive Management Program in consultation with resource agencies. In comments provided in response to the Draft License Application, NOAA Fisheries/NMFS indicated that Saluda Hydro and other Santee Basin projects potentially affect important historical spawning and maturation habitat for a number of diadromous fish species, including the federally endangered shortnose sturgeon and Atlantic sturgeon, a candidate for federal listing. After several consultation meetings with resource agencies, the Sturgeon Protection and Adaptive Management Program was deemed acceptable to address these potential effects. Components of this Program include the establishment of a Technical Advisory Team composed of the licensee and state and federal resource agencies. Furthermore, a series of Sturgeon studies will be performed through the Santee Basin Cooperative Accord, described below in Section 5.2.7. SCE&G will consult directly with the Technical Advisory Team to ensure that the study objectives are met through, or outside of, the Accord process. Studies performed relevant to the development of this management program include the 2007 Sturgeon Survey of the Lower Saluda and Upper Congaree Rivers. These studies resulted in no captures of adult or juvenile sturgeon. Although the NMFS did not provide comments, SCE&G communicated with them regarding the shortnose Sturgeon and Section 7 (Endangered Species Act) requirements for relicensing. SCE&G's understanding, as it is identified in the Summary of the June 15, 2010 Teleconference on Shortnose Sturgeon issued by the FERC on June 22, 2010, is that it is not NMFS's intention to recommend changing any of the flows recommended in the CRSA. FERC revised the Draft Environmental Assessment addressing additional informational needs requested by NMFS. The Biological Assessment (BA) was included in the final FERC Environmental Assessment (EA). In response to issuance of the BA, FERC requested NMFS to prepare their Biological Opinion in a minimum of 135 days. Upon issuance of the Final BO, FERC may consider and/or impose additional conditions in any new License granted to SCE&G.

3.7 Recreational flows (CRSA Appendix A-2)

As noted in the Project Recreation Plan, and as agreed upon through stakeholder meetings, SCE&G will make approximately 45,000 acre feet of water per year available for recreational flow releases into the lower Saluda River. These flows will occur on no more than 51 days. The Project will be removed from reserve status for safety reasons during the recreational flow hours on those 51 days. SCE&G will host

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an annual meeting during October of each year to review the previous year's flows, set the specific dates for the following year's flows (with the understanding that the total volume of water to be made available for recreational flows and the number of days of recreational flows will remain consistent from year to year, even if the schedule varies), and discuss any outstanding issues with appropriate stakeholders. Further, a determination will be made as to the allocation of recreational flows for the upcoming recreational season should the Maintenance, Emergency and Low Inflow Protocol (MELIP) have to be implemented. Additionally, SCE&G will host triennial meetings for comprehensive reviews of the recreation flow schedule for the purpose of reviewing recreation trends. SCE&G will make reasonable efforts to provide all requested flow releases. However, due to Project equipment mechanical and operational limitations, it is recognized that these are "target" flows and actual flows may vary to some extent. Further information and an initial schedule for recreational flows are included in the Recreation Plan.

4. Water Quality Assessment

The water quality assessment is based on applicable water quality standards and classifications for Freshwater (FW) applicable to Lake Murray, and Trout Put Grow and Take (TPGT) applicable to the Lower Saluda River in accordance with SCDHEC Water Quality Standards (R.61-68 and R.61-69).

The current site specific D.O. standard for the Lower Saluda River (LSR) was developed after SCE&G worked cooperatively with SCDHEC, the South Carolina Department of Natural Resources (SCDNR), and the Environmental Protection Agency (EPA) to develop and conduct a variety of site-specific studies.

These studies were aimed at establishing a scientifically based, site specific D.O. standard for the LSR and included the following:

- An in-situ trout growth study (conducted during 2002-2003).
- Turbine venting modeling.
- Hydrodynamic tailwater water quality modeling.
- Fish bio-energetics modeling.

A detailed report was prepared upon completion of the studies. The report analyzed and disclosed the results of the scientific investigations supporting the resulting site-specific standard, which was adopted May 7, 2002.

- a). Are turbidity increases expected?
Yes () Temporary () No (x)

The project does not conduct sediment flushing as part of its operational regime.

- b). Numeric Standards Contraventions?
Yes () Temporary (x) No ()

4.1 Water Quality Monitoring

4.1.1 Lake Murray

SCE&G has worked with SCDHEC and US Geological Survey (USGS) for a number of years monitoring the water quality in Lake Murray. In preparation for relicensing, data collected as a result of this water quality monitoring effort, from 1974 to 1998, was recently compiled into a database to assist in the evaluation of historical trends in the water quality of Lake Murray and its drainage area up to Lake Greenwood (REMI, 2005). Water quality information was subsequently compiled into a comprehensive water quality report.

Furthermore, extensive water quality profiles, including dissolved oxygen (D.O.) and temperature, were performed in Lake Murray throughout the 1990s. Longitudinal contour plots were developed using D.O. profiles from seven different locations in the lake, which are plotted at their location relative to the Dam (x-axis) versus elevation or meters above sea-level. This report provided a historical baseline for further water quality studies performed in support of the relicensing proceedings before the FERC.

Results of this water quality study were reviewed to determine compliance with the water quality standards and protection of the classified and existing uses of the Lake Murray. In addition, SCDHEC routinely collects data from 29 sites located throughout the lake. This data is assessed for compliance with water quality standards and used in the biennial Integrated Report, which includes the 303(d) list of impaired waters.

4.1.2 Lower Saluda River (LSR)

SCE&G began monitoring D.O. and temperature in the releases from the Project turbines in 1989 and continues the effort to the present day. Additionally, in 2006, United States Geological Survey (USGS) in consultation with SCE&G and SCDHEC, relocated the water quality monitoring gage in order to provide for more accurate water quality readings. The gage was relocated further out within the river channel, as this was determined through study to best address the issue of fouling of monitoring equipment sensors.

In an effort to increase the D.O. levels in the releases from the Project turbines, SCE&G has implemented a range of equipment and operational improvements, beginning with the installation of turbine vents and the modification of operations in 1999. The median D.O. concentration of the water released from Lake Murray has increased from 2.7 mg/L (before implementing turbine venting) to 7.2 mg/L (with turbine venting - 1999 to present). This has resulted in a significant lowering of the frequency of occurrences of even briefly below standard D.O. levels in the water releases.

In comments issued in response to the Initial Consultation Document (ICD), the USFWS requested a study to document the extent of downstream influence of coldwater releases from Saluda Hydro (letter dated August 1, 2005). A study plan was developed and approved by the Water Quality Technical Working Committee ("WQTC") on March 13, 2006. The study objective was to characterize the effects of water releases from the Project Dam on the temperature regime of the LSR and Congaree River, including downstream extent of temperature alteration, timing and duration of temperature alteration, and mixing characteristics.

Project releases were found to result in cross-sectional differences in water temperature in the Congaree River downstream of the confluence, with the LSR side of the channel being significantly cooler than the Broad River side. Study results suggested that temperature patterns on both banks generally follow a pattern similar to the Broad River, except during periods of generation at Saluda Hydro, during which temperature alterations were detectable throughout the study area. Data suggest that mixing is complete somewhere between the Interstate 77 Bridge and River Mile 35 (approximately 8 miles upstream of Congaree National Park).

Of special note, results of data collected during this study also indicated that water temperatures in the LSR never exceed 22° C as far down as the confluence of the Broad and Saluda Rivers under a flow of 400 cfs and higher. This temperature level is protective of both rainbow and brown trout habitats as they have lower temperature tolerances than indigenous fish species inhabiting the LSR.

In addition, SCDHEC routinely collects data from 3 sites located in the Lower Saluda River. This data is assessed for compliance with water quality standards and used in the biennial Integrated Report, which includes the 303(d) list of impaired waters.

4.2 Water Quality

4.2.1 Lake Murray

Typical of southern, deep-water reservoirs, Lake Murray thermally stratifies each year, forming three different layers in the water column generally during the months of July through November/December. The hydrology of each year affects the levels of nutrients, algae, and other organic matter that enter the lake. In turn, the level of nutrients, algae, and other organic matter within the reservoir affects significantly the D.O. demand. D.O. demand derives in large part from the amount of oxygen required to decompose the organic matter that ultimately is produced by the nutrients and algae. Finally, sediment oxygen demand can contribute materially to the D.O. levels in the lake-bottom waters.

Lake Murray is water quality impaired for aquatic life use at 4 sites based on the 2010 303(d) list (see Section 1). These impairments are due to high nutrient levels and nutrient related high pH and chlorophyll *a*, as well as copper. These pollutants are introduced into the watershed through point and nonpoint sources not associated with the operation of SHP. Therefore, continued operation of the SHP will not contribute to these impairments.

4.2.1.1 Lake Murray CE-QUAL-W2 Studies

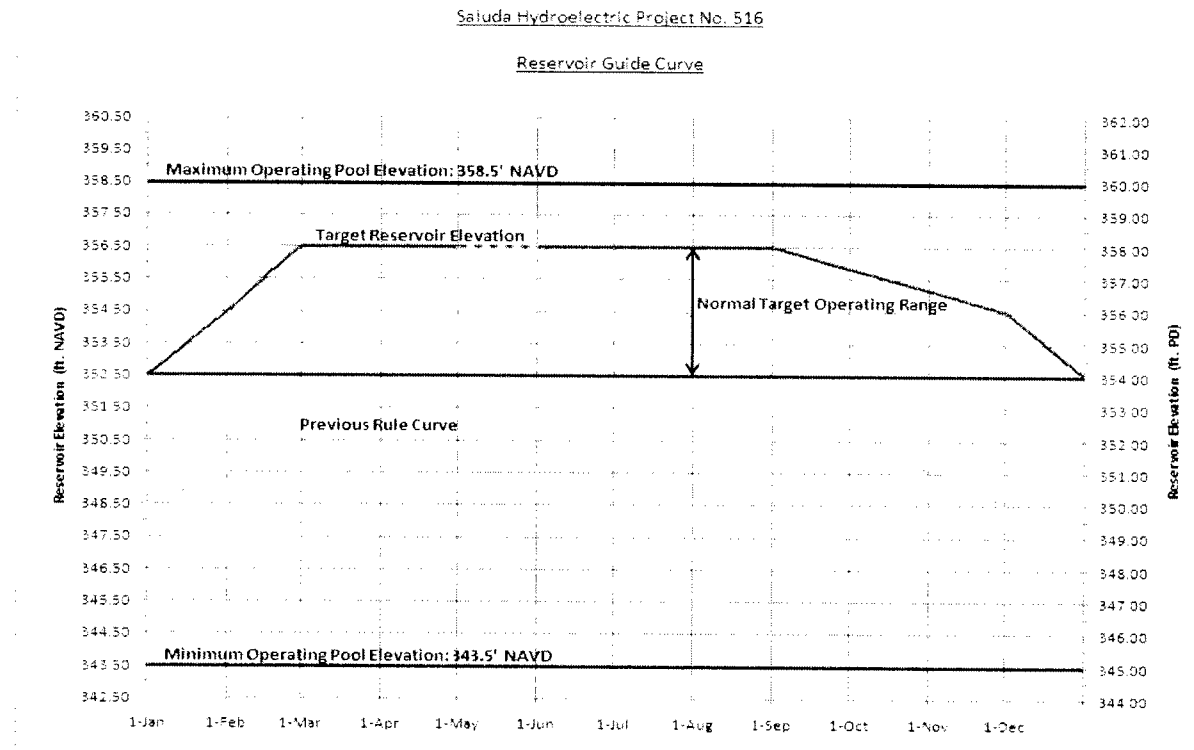
From the comprehensive water quality report prepared for the Saluda Hydro relicensing, data reflecting the trend in the level of phosphorous indicates potential problems with nutrient loading into Lake Murray and resulting negative impacts on discharges into the LSR. As a result, SCE&G evaluated the potential effects upstream nutrient reduction efforts could have on the D.O. levels in Lake Murray and consequently, the releases from Saluda Hydro. After an extensive review of the water quality data gathered for Lake Murray and its inflows by SCDHEC, USGS and SCE&G, a CE-QUAL-W2 model was developed for Lake Murray (Ruane, 2004).

Currently, there are no numeric phosphorus concentration standards for streams and/or rivers in the state of South Carolina. However, a 0.06 mg/L standard is in effect for lakes/reservoirs in the Piedmont and Southeastern Plains ecoregions of the state. To better understand how Phosphorus inputs effect water quality conditions in Lake Murray, the CE-QUAL-W2 model was developed with model simulations run assuming assuming phosphorus concentrations in inflow streams and /or rivers to Lake Murray were consistent with SCDHEC standards for lakes within that ecoregion. When reducing the phosphorus loads to these SCDHEC maximum allowable levels, the model showed substantial improvements in water quality conditions in Lake Murray. Moreover, the D.O. levels in the turbine releases from Saluda Hydro were also shown to increase to such an extent that alternative aeration of the water may not be needed for the D.O. in the turbine releases to consistently meet state standards for the LSR. Furthermore, it is inferred that, as a result of phosphorus reductions, striped bass habitat within Lake Murray would be greatly improved, as well as the pH levels on the LSR (Ruane, 2004).

Results from the Lake Murray study were compared to results achieved by modeling projects similar to Saluda Hydro. Data derived from the CE-QUAL-W2 model predicted that the most likely cause for water quality problems in Lake Murray stem from the point source discharges of phosphorus into Ninety-Six Creek and the Bush River. Model results estimated that 60% of the phosphorus input into Lake Murray occurs as a result of discharge from point sources outside of the Project boundary. The results of this study have provided a good forum for discussions within the relicensing processes and have provided a baseline for additional water quality studies within the reservoir.

4.2.1.2 Guide Curve for Lake Murray Lake Levels (CRSA Appendix A-14)

As a result of Comprehensive Relicensing Settlement Agreement (CRSA) discussions, a guide curve was developed in part with the objective of protecting the environmental, cultural, recreational and economic resources associated with and dependent upon the reservoir. SCE&G proposes to operate Saluda Hydro so as to moderate lake level fluctuations, to address safety issues, improve recreation opportunities, and to support downstream flow targets, including striped bass flows. Moreover, SCE&G proposes to make all reasonable efforts to operate during Normal Inflow Periods within a range of four feet, from a normal target operating lake level of 358' plant datum (PD) between March 1 and August 31, and a lower operating limit of 354' PD for the remainder of the year (see following illustration).



4.2.1.3 Increasing Target Winter Minimum Pool Levels for Normal Operations of Lake Murray and Implementation of a Drawdown Program (CRSA Appendix A-12).

During the relicensing process, SCE&G commissioned a qualitative risk analysis of the potential effects of increasing the target winter minimum pool level of Lake Murray. The product of that analysis was a whitepaper dated June 3, 2008 (Ruane, 2008). Over the past 28 years the normal winter minimum pool elevation at Lake Murray has varied between 348' PD and 354' PD. In general, it has reached near 350' PD for about half the years and near 354' PD the remaining years. The summarization of the analysis contained here focuses on the postulated likely effects of consistently increasing the minimum pool elevation to 354' PD or higher every year during the late fall and winter months.

The analysis suggested five probable consequences of increasing minimum winter pool levels - two direct and three derivatives. The two direct impacts would be (1) a decrease in shoreline sediment

scouring, particularly in the areas of tributary inflow and (2) an increase in sediment and nutrient deposition, particularly in the upper one to two miles of the lake - in the inflow area. Impacts that would derive from this increased sediment and nutrient accumulation would likely include (1) a decrease in water quality in the lake and Project discharges, (2) an increase in upstream backwater problems leading to more frequent and higher magnitude flooding, and (3) an increase in aquatic plant colonization within the lake.

During the CRSA discussions, several entities noted that due to the research and findings by Reservoir Environmental Management, Inc. (REMI), an adaptive management approach for water quality drawdowns needed to be developed. SCDNR, in particular, stated that they would like the ability to request a water quality drawdown for specific situations such as aquatic plant management. Subsequently, the settling parties developed the Reservoir Drawdown Program and filed it as part of the CRSA. In this program it is acknowledged that reservoir drawdowns can be an effective management tool to address undesirable aquatic plants, fisheries management, and water quality; and periodic reservoir drawdowns of Lake Murray may be utilized during the new license period. This also allows opportunities for dock maintenance, shoreline stabilization, limited excavations and other lake user maintenance activities.

The settling parties agreed on the frequency of drawdowns, as well as an inflow trigger that would statistically allow for the refilling of the reservoir in time for the recreation season. The parties further agreed that a winter drawdown to el. 350 ft. PD would be implemented every third year if the average November flow at the USGS Gage 02167000, Saluda River at Chappells, SC is equal to or greater than 1,500 CFS. It is also proposed that the drawdown be conducted during December. Once the 350 ft. PD reservoir elevation has been attained, the reservoir will be held at this elevation for a period of 28 days. Following this period, the reservoir will be allowed to return to or above the guide curve as quickly as inflow will allow, while maintaining downstream minimum flow requirements. During release of flows for a drawdown, consideration will be given to the effects on downstream resources. If a drawdown is not conducted in the third year, SCE&G will convene a meeting with the Drawdown Advisory Group (DAG). The DAG will consist of SCE&G, state and federal agencies, and other relicensing stakeholders with relevant experience and interest. In the event a drawdown is not conducted according to schedule, the DAG will make a drawdown recommendation to the Drawdown Regulatory Committee (DRC) for review and comment. The DRC will consist of SCE&G (chair), SCDNR, SCDHEC and USFWS.

4.2.2 Lower Saluda River (LSR)

The LSR is water quality impaired for aquatic life use at 3 sites based on the 2010 303(d) list (see Table in Section I). These impairments are due to high turbidity levels and mercury levels in fish tissue. These pollutants are introduced into the watershed through nonpoint sources and atmospheric deposition, respectively, and are not associated with the operation of SHP. Therefore, continued operation of the SHP will not contribute to these impairments. However, operation of the SHP directly affects D.O. levels in the LSR, particularly when releasing hypolimnetic water during periods when the lake is stratified. It is important to note that, due to improvements in turbine venting and other operational changes of the SHP, the Lower Saluda River has not been impaired due to low D.O since the 2004 303(d) list. As data supports, D.O. levels in the LSR have risen dramatically since 1999 to instantaneous levels of 4.0 mg/l nearly attained 100% of the time. Although the D.O. standard occasionally is not met when high flows are released, these excursions do not occur frequently enough to cause impairment based on the 303(d) assessment methodology.

4.2.2.1 Past Upgrades to Improve Water Quality in the LSR

In an effort to increase the D.O. levels in the releases from the Project turbines, SCE&G has implemented a range of equipment and operational improvements, beginning with the installation of turbine vents and the modification of operations in 1999. The median D.O. concentration of the water

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released from Lake Murray has increased from 2.7 mg/L (before implementing turbine venting) to 7.2 mg/L (with turbine venting - 1999 to present). This has resulted in a significant lowering of the frequency of occurrences of even briefly below standard D.O. levels in the water releases.

Increases in D.O. levels in the LSR can further be attributed to the 2005 installation of hub baffles on all five Saluda Hydro units. Extensive testing of turbine aeration efficiency during fall 2005 and 2006 yielded variable results; some units demonstrated considerable aeration potential while other resulted in only marginal D.O. improvements. Also in 2005, SCE&G implemented operational protocols that further assist in maintaining enhanced D.O. levels in the LSR. Specifically, "look up" tables, depicting best operational scenarios to optimize aeration capacity, were developed based on a detailed turbine venting model. These tables provide guidance to SCE&G System Operators regarding the unit and gate setting combinations that provide the greatest D.O. enhancement under various operating scenarios. To ensure continuing enhancement of D.O. levels, this model is reviewed on an annual basis and the "look up" tables are updated accordingly based on any new pertinent testing or operational data.

During the summer of 2007, additional improvements were made to some units to increase the oxygenation of water releases. Efficiency testing demonstrated that the replacement of the nose cone and hub baffle installation on the nose cone, along with the repair of the failed headcover seal, allowed Unit 3 to aerate similar to Units 1 and 4 in 2007. It was also shown that repairing the headcover seals on Unit 2 allowed it to aerate more like Units 1 and 4, as well. However, it was shown that the larger hub baffles installed on Unit 5 were not successful in increasing airflows into the unit. The "look up" tables were subsequently updated with the new 2007 efficiency data as a result of the unit improvements.

Daily average D.O. levels in the Project releases from 1999-2007 were periodically below 4.0 mg/L, primarily during high release periods from the Project. In 2008 studies, the most recent full year data available, dissolved oxygen levels in the LSR, measured below Saluda Hydro, met or exceeded the instantaneous minimum standard of 4.0 mg/l 99.65 % of the time. There were no excursions of the daily average D.O. of 5 mg/L or the 30-day average D.O. of 5.5 mg/L in 2008.

4.2.2.2 Proposed Installation of New Project Runners to Meet D.O. Standards in the LSR (CRSA Appendix A Section 4.1).

SCE&G proposes to install new runners and other associated upgrades to potentially all five units as described in CRSA.

The upgrade of Unit 5 will be completed within three years from issuance of the license. The upgrade of that unit is expected to take as long as three years to account for the need to accommodate the extensive design and testing necessary to assure the new runner meets the performance objectives. Subsequent to the Unit 5 upgrade, downstream water quality will be assessed, employing the adaptive management process. Subsequent unit upgrades will proceed thereafter as follows:

- Should it be necessary to upgrade another unit to assure support of the SCDHEC LSR site specific DO standard, SCE&G will perform the upgrades on the following schedule:
 - Upgrade one of the smaller units (preferably Unit 3) within two years after the completion of the upgrade to Unit 5.
 - This process will be repeated with the sequential upgrades of Units 4, 1, and 2, each being achieved within two years after the completion of the previous unit upgrade should the effects of that prior upgrade not support the water quality goals. The sequence of unit upgrades as noted may change. SCE&G will designate the next unit for upgrade at the completion of the previous upgrade.

- After all unit upgrades and testing have been completed, if Saluda Hydro operations do not support the South Carolina LSR site specific D.O. standard, SCE&G will meet with SCDHEC and CRSA signatories within one year after the final unit upgrade and testing has been completed to develop a plan to assure future support of the standard. If an acceptable plan has not been developed within one year to assure that the Project supports the South Carolina LSR site specific D.O. standard, a party may withdraw from the CRSA and take independent action to assure support of the standard.
- Should the South Carolina LSR site specific D.O. standard be fully supported with installation of Unit 5, SCE&G will perform the upgrades on the following schedule:
 - Unit 3 will be upgraded within five years after license issuance;
 - Two units (preferably Units 4 and 1) will be upgraded within 15 years of license issuance; and
 - The last unit (preferably Unit 2) will be upgraded within 25 years after license issuance.

In the event that reliability or other issues require the upgrade of one or more of the units sooner than proposed, the schedule may be accelerated to meet the identified need.

Until these upgrades are complete, SCE&G proposes to continue with turbine aeration measures (i.e. turbine venting and hub baffles) and operational modifications implemented since 1999 and as conditioned by the Commission in its order issued in *South Carolina Electric & Gas Company*, 109 FERC 61,316 (2004).

3. Will the proposed activity cause alterations of current patterns or water circulation?
Yes (x) No ()

See the previously shown new reservoir level guide curve for Lake Murray and the following discussion addressing minimum flows in the Lower Saluda River.

4. Will the proposed activity cause alterations of normal water fluctuations?
Yes (x) No ()

See the previously shown new reservoir level guide curve for Lake Murray and the following discussion addressing minimum flows in the Lower Saluda River.

5. **Aquatic Community Impacts:** Yes () Amount: N/A No (x)
Permanent () Temporary () Cumulative ()

In addition to the above measures to meet the D.O. standard in the LSR, the proposed continued operation of the Saluda project will operate in a manner to enhance striped bass habitat in Lake Murray and increase existing flows in the LSR downstream of the project to enhance aquatic habitat for Trout and other target communities as follows:

5.1 Lake Murray

5.1.1 Project Operations and Lake Murray Summer Striped Bass Habitat

Lake Murray has experienced periodic striped bass mortalities in the vicinity of the Saluda Dam during
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late-summer and early-fall since at least the early 1970's. Striped bass mortality events similarly have been observed at other reservoirs in the southeastern states, including Lake Norman (NC), J. Strom Thurmond Reservoir (GA), Lake Gaston (VA), and Cherokee Reservoir (TN). Since the SCDNR began tracking the magnitude of these episodes in the early 1980's, striped bass "die-offs" have been reported in 1989, 1990, 1991, 1993, 1998, 2005, and 2007 (R. Ahle, SCNDR, Memorandum dated March 24, 2006; SCDNR, Press Release #07-255, September 10, 2007). These die-offs have been attributed to water quality impacts associated with stratification of the lake during the summer months. Specifically, striped bass are a coolwater species and thus during the summer months are often restricted to thermal refuge habitat in deeper hypolimnetic waters. During the summer and early fall, D.O. levels slowly decline in the hypolimnion thus reducing the amount of thermal refuge habitat for striped bass. D.O. stresses associated with this phenomenon, known as the "temperature-oxygen squeeze," have been cited as the primary cause for the striped bass mortality events in Lake Murray (Hayes, 1994).

Following the largest documented striped bass kill in 1991 (3,139 fish), the SCDNR speculated that operation of the Saluda Unit 5 may be a contributing factor to the mortality events. Specifically, it was postulated by state and federal resource agencies that operation of Unit 5 might reduce the size of thermal refuge areas and increase stress levels on striped bass due to the mid-column depth of the Unit 5 intake (approximately 80ft below typical summer pool of 355' Plant Datum or PD (+/- 3 ft)). In the mid 1990's, SCDNR and SCE&G subsequently agreed to a "last on, first off" operational scenario for Unit 5 aimed at reducing its use during the late summer and early fall. While originally designed to prevent blueback herring entrainment events, it was theorized by state and federal resource agencies that the "last on, first off" Unit 5 scenario would also help preserve striped bass refuge habitat and minimize the potential risk of die-offs. During the current relicensing effort, the SCDNR and other stakeholder groups requested an evaluation of the factors contributing to observed declines in striped bass summer refuge habitat and resulting fish kills, as well as an analysis of the effectiveness of operational measures undertaken to reduce such events (i.e. the "last on, first off" operating regime for Unit 5). The Water Quality TWC subsequently determined that use of the CE-QUAL-W2 water quality model, which had been previously developed and calibrated to the Lake Murray system (Ruane, 2004), would be the best tool for this purpose.

The results from the CE-QUAL-W2 water quality model suggested that striped bass die-offs are likely related to high reservoir inflows, in particular high inflows during the months of March through August (Ruane, 2008b). Higher inflows presumably cause the bottom of the lake to warm, which in turn increases the rate of D.O. depletion. Modeling efforts also suggested that operating Unit 5 in "first on, last off" mode, rather than the current "last-on, first off" mode, could potentially help preserve colder bottom water under some scenarios, resulting in increased available refuge habitat for striped bass (i.e. water with temperature <27°C and D.O. >2.5 mg/L) during some years. Further, striving to keep the Lake Murray summer pool at elevation 358' PD (356.5' North American Vertical Datum 1988 [NAVD88]) was found to enhance marginally or have no effect on preservation of coolwater refuge habitat, with four of the eight years modeled demonstrating slightly increased volumes of water with temperature <27°C and D.O. >2.5 mg/L. Modeling of the combined effects of the Unit 5 "first on, last off" scenario and the 358' PD summer pool elevation yielded similar results, with increased refuge habitat observed in three of the eight years modeled. Further modeling was also performed as a result of Settlement Agreement discussions to observe a high, low, and normal inflow year based on the new proposed guide curve and low flow criteria. This study found that for all of the years modeled for Unit 5 in first-on, last off mode, there were significantly cooler releases and lake temperatures than for the scenarios where Unit 5 was run last-on, first-off. Thus, it was recommended that to the extent possible, that Unit 5 be run in first-on, last-off mode from November through July of each year (Ruane, 2009).

These findings were discussed in detail in both the TWC as well as in the CRSA meetings. The group agreed that it may be best to take an adaptive management approach with respect to this issue. Therefore, it was proposed within the CRSA that within one year after completion of Unit 5 upgrades, SCE&G will consult with the SCDNR, SCDHEC, USFWS, other applicable resource agencies and non-

agency signatories to the CRSA to evaluate Unit 5 operational scenarios to determine effectiveness in preservation of the cool-water refuge habitat for the benefit of the reservoir and riverine fisheries.

5.2 Lower Saluda River

5.2.1 Minimum Flows for the Lower Saluda River (CRSA Appendix A-11)

Currently, SCE&G has an agreement with SCDHEC to provide a minimum of 180 cfs from Saluda Dam. This flow rate was based on calculated 7Q10 flow for dilution purposes in the LSR. During the relicensing process, the USFWS, SCDNR, and various non-governmental organizations ("NGOs") requested that SCE&G examine alternative flows by conducting an Instream Flow Incremental Methodology Study ("IFIM") for the LSR downstream of the Project Dam.

In response to the above mentioned study request, SCE&G formed an Instream Flows/Aquatic Habitat Technical Working Committee ("IFIM TWC") to further explore this issue. The IFIM TWC identified the following issues that an instream flow study would provide data for: altering the existing regulated flow in the LSR; assist in identifying minimum flows that are protective of aquatic habitat; provide data that can be used to weigh the effects of managing Lake Murray water levels on downstream habitat; and provide data that can be used to weigh the effects of reserve operations on downstream habitat.

The IFIM TWC elected to use a Physical Habitat Simulation ("PHABSIM") model to quantify these relationships. The model quantified flows that meet habitat requirements to support a balanced aquatic community based on model results representing targeted diadromous and resident fish, trout, shortnose sturgeon and other aquatic biota (*i.e.* habitat use fish guilds and macroinvertebrates). The study area comprised the LSR between Lake Murray and the confluence with the Broad River. A total of 10 study sites were distributed among the reaches, and a total of 21 PHABSIM transects were located among the study sites. The group also considered Zone of Passage criteria for millrace, where passage may be the most limiting for migratory species. Based on discussions within the IFIM TWC, habitat-discharge relationships were initially developed for 32 species/lifestages. Data were collected during June and July, 2007; modeling was performed during September through October, 2007.

A standard PHABSIM modeling approach rated habitat suitability for each applicable guild, species and lifestage at flow increments across the range of interest using Weighted Usable Area ("WUA") as the index. The IFIM TWC determined that the model data indicates that a minimum flow of 400 cfs would provide nearly 80% of maximum WUA for all species/guilds (see following table). Further, based on an analysis of temperature data in the LSR, 400 cfs would provide suitable habitat conditions protective the put, grow and take trout fishery, a designated use of the waterbody. According to the CRSA, 400 cfs is considered the minimum flow for the Project. Interestingly enough, a minimum flow of 400 cfs in most cases provides a higher percentage of usable habitat for most species and habitat guilds than do striped bass habitat enhancement flows described below.

Comparison of Habitat Optimization in percentages for Key Guilds and Species in the Lower Saluda River at Flows Ranging from 400 to 2,800 cfs

Flow (cfs)	Guilds				Species				Average for all Groups
	Deep Fast	Shallow Slow	Shallow Fast	Rainbow trout	Rainbow Trout	Brown trout	Brown trout	Smallmouth bass	
				Adult	Juvenile	Adult	Juvenile	Spawning	
400	75	86	79	81	97	83	97	57	82
700	86	63	99	94	100	100	100	88	91
1000	95	61	80	99	95	85	90	93	87
1300	100	72	66	100	87	77	76	98	85
1600	99	67	61	100	79	76	66	100	81
1900	96	60	56	98	74	76	61	100	78
2200	94	59	49	93	67	69	52	97	73
2500	91	57	45	86	64	64	48	95	69
2800	88	57	42	80	58	56	41	90	64

Implementation of Enhancement Flows for the lower Saluda River

In addition to implementing a minimum flow of 400 cfs in the LSR, SCE&G is proposing to provide the following enhancement flows during normal flow years (i.e. not during low or high inflow protocols):

Jan. 1—March 31:	700 cfs – LSR enhancement flow
April 1—May 10:	Striped Bass Enhancement Flow Regime (discussed below)
May 11—May 31:	1000 cfs – enhancement of adult trout and striped bass habitat
June 1—December 31:	700 cfs – LSR enhancement flows

Because the Project is operated primarily and critically as a reserve facility, in the event of a reserve call, the Project outflows will likely increase above target minimum flows for short durations. In addition, recreational flow events, outlined in the Recreation Plan will increase the referenced minimum flows for the duration of the events. In the event of a drought or low inflow period, minimum flows for the LSR will conform to the Maintenance, Emergency and Low Inflow Protocol (MELIP), discussed in more detail below.

5.2.2 Striped Bass Enhancement Flows

In the process of TWC discussions, the SCDNR proposed a Striped Bass Enhancement Flow Regime as a means of improving conditions for striped bass spawning in the Congaree River. It is SCDNR's contention that conditions most favorable to striped bass spawning have historically occurred when flow in the Congaree River near the I-77 bridge was approximately 9,000 cfs during the April 1 through May 10 period. SCDNR also noted that favorable conditions are thought to have occurred when the Saluda River contributes approximately 30 percent of the total flow in the Congaree River at Columbia. This corresponds to a flow in the Saluda River which would be approximately 45 percent of the flow in the Broad River as measured at the USGS Broad River at Alston, SC gage site (No. 02161000).

Although this request is for improvements to the Broad and Congaree Rivers, as well as the furthest reaches of the LSR, are outside of the lower end of the Project boundary, in the interest of developing a CRSA, SCE&G and other signatories to the Settlement Agreement worked to develop an adaptive management program to address this request. It should be noted that flows requested to enhance striped bass habitat have a slightly negative impact on WUA for those fish species and life stages modeled in the IFIM study of the LSR. However, generally speaking the flows requested generally meet the 80% criteria established by the TWC.

The SCDNR developed a target flow regime for the Saluda Project designed to maintain a Saluda River 30 percent flow contribution to the Congaree River when flow in the Broad River at Alston is between 2,500 and 8,000 CFS during the April 1 — May 10 period each year. The Striped Bass (STB) target flow request is summarized as follows:

- April 1 – May 10: Each day that the previous day's daily average flow in the Broad River (measured at Alston gage) is between 2,500 CFS and 8,000 CFS, Saluda will release as a continuous target flow equal to the lesser of:

45% of the previous day's daily average flow in the Broad River at the Alston gage, or the balance of what is required to create a 9,000 CFS in the Congaree River.

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- The STB request flows are intended to be released continuously 24 hours per day and will be treated as target flows subject to a 1,000 CFS minimum flow to be released from Saluda Hydro when the previous day's daily average flow in the Broad River (measured at Alston gage) is less than 2,500 CFS or greater than 8,000 CFS. The STB target flow for a given day will be released to the extent possible as a continuous flow.

It is recognized that STB habitat enhancement flows will be determined on a daily basis using the previous day's average flow in the Broad River measured at the Alston gage. For compliance purposes SCE&G will be granted a plus or minus 100 CFS variance of the STB target habitat enhancement flows as part of the program. Non-compliance will not be declared if conditions causing excessive or deficient flows result from matters beyond the reasonable control of SCE&G. There will be no restriction on additional generation by Saluda Hydro if required during the STB flow period. When additional generation is no longer required on a given day, the STB target flow for that day will be resumed. During the period from April 1 – May 10 when the previous day's average flow in the Broad River at the Alston gage is less than 2,500 CFS or greater than 8,000 CFS, STB target flows will not be in effect and a continuous minimum flow of 1,000 CFS will be released.

The implementation of these flows is being done on a 10 year interim basis, with reviews of the data during the 6th and 11th year after the license issuance, under an Adaptive Management approach, the result of which may require changes in the flows.

5.2.3 Enhancements to the Lower Saluda River (LSR) Trout Fishery (CRSA Appendix A-7).

As discussed above, the LSR is classified by the SCDHEC for regulatory purposes as Trout Put, Grow, and Take (TPGT) Waters. The current TPGT program is supported via annual SCDNR stockings of brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*). In comments issued in response to the Initial Consultation Document (ICD), the Saluda River Chapter of Trout Unlimited requested that SCE&G evaluate the potential for establishment of a self-sustaining and/or reproducing trout fishery on the lower Saluda River downstream of the Project. The Instream Flow/Aquatic Habitat TWC subsequently drafted a technical white paper summarizing the spawning requirements for the two trout species currently stocked in the LSR, and comparing those requirements to conditions in the LSR. The white paper concluded that, while existing habitat and water quality in the LSR generally provide suitable growing conditions for much of the year for adult brown and rainbow trout, the area is unlikely to support a self-sustaining fishery due to a number of factors, including the presence of predatory striped bass, marginal spawning and incubation water temperature (brown trout), limited amount and quality of gravel spawning beds for both species, and discontinuous and limited fry and juvenile nursery habitat.

Although these results concluded that a self-sustaining trout fishery was not likely, during subsequent TWC and Settlement Agreement discussions it was requested that SCE&G participate in the monitoring and potential enhancement of the TPGT fishery. In response, SCE&G, through consultation with the Instream Flow and Aquatic Habitat TWC, developed the Trout Evaluation and Monitoring Program for the LSR, and filed it with the CRSA. The purpose of this program is to monitor and assess the success of water quality and flow enhancement measures on the trout fishery. Furthermore, the program will determine a process for evaluating changes and making decisions that contribute to SCDNR's management of the fishery based on the best available information. Subsequent to the issuance of the new Project license, an Advisory Committee (AC) of SCE&G, resource agencies, and other signatories to the CRSA will be formed. This AC will work to develop success criteria for program goals. Furthermore, the enhancements, discussed above, such as turbine venting, the upgrade of unit runners, alternate operating scenarios, and implementation of instream flow recommendations will further enhance the

habitat for these species. As such, the AC will monitor water quality and flow data prior to these enhancements in order to establish an appropriate baseline for further studies on the effects of these enhancements to the trout fishery. Additionally, trout, ichthyoplankton, and macroinvertebrate sampling are proposed as components to this plan to aid in future management decisions by SCDNR.

Furthermore, at the request of SCDHEC, SCE&G will conduct an in-situ trout growth study in the LSR subsequent to the issuance of the new license. The trout growth study will begin after the unit upgrades have been made according to the proposed schedule in the Trout Evaluation and Monitoring Program. The purpose of this study is to determine growth rates as inputs to bioenergetics modeling of rainbow trout consistent with studies in the LSR done in 2003. The trout growth study will be conducted during December—May and employ tag and recapture techniques utilized in the 2003 growth study conducted in LSR.

A component of the Trout Evaluation and Monitoring Program also includes the contribution by SCE&G of \$30,000.00 to the SCDNR to assist in funding a trout mortality study conducted by their agency. SCDNR will perform all aspects of the mortality study and will provide a copy of the study plan or scope of work to SCE&G prior to implementing the study. SCE&G will make the funds available to SCDNR in the year the study is to be performed.

5.2.4 Enhancements to the Mussel Assemblages in the Project Area (CRSA Appendix A-4)

During the relicensing process, SCE&G conducted an intensive mussel survey of the Project Area. A total of 65 sites were surveyed for the presence of freshwater mussels during the Summer of 2006. Surveys revealed 15 species to be extant in the study area. None of the species documented from the study area are federally listed as threatened or endangered, although 6 are federal species of concern. In Lake Murray and its tributaries, 11 native freshwater mussel species were identified. No mussels, including threatened and endangered species, were collected in the LSR downstream of the Saluda Dam. However, 9 native species were documented in the upper Congaree River and the confluence area of the Broad and Saluda Rivers.

In order to enhance mussel populations, and provide additional knowledge based on unique mussel species, SCE&G has worked with the USFWS and other stakeholders to develop a Freshwater Mussel Enhancement Program (and minor modifications proposed by the FERC in the final EA) including a phased, adaptive strategy for mussel monitoring and restoration efforts. An additional follow-up survey was requested for 10 years after the initial Congaree River survey. Furthermore, the USFWS has shared plans to reintroduce mussel populations to the Project vicinity. Five years subsequent to mussel reintroductions, SCE&G has proposed to do an additional follow up survey, as well. Details of the proposed studies are provided in the CRSA Appendix, with proposed modifications contained in the FERC Final EA. Although several of the aforementioned study components require efforts outside of the Project boundary, these studies were chosen because they were deemed by resource agencies as most likely to benefit mussel populations, as a whole. It is also recognized that further D.O. improvements are expected with the proposed unit upgrades, thus potentially improving mussel habitat in the LSR in the future.

5.2.5 Macroinvertebrate Monitoring (CRSA Appendix A-3)

The benthic macroinvertebrate community of the LSR, downstream of Saluda Hydro, has been assessed regularly by SCE&G over the past decade (Shealy, 1996a; 1996b; 2001; 2004; 2005; Carnagey Biological, 2006; 2007). Recent assessments have shown that biotic conditions (based on metrics such as taxa richness and abundance, EPT Index, EPT abundance, and dominant taxa) improved with increased distance from the Project dam (Shealy, 2004; 2005; Carnagey Biological, 2006; 2007). Similarly, North Carolina Biotic Index (NCBI) scores from these studies have generally ranged from “good” to “fair” for lower sites near the Riverbanks Zoo, to “poor” at sites directly below the dam (Shealy, 2004; 2005; Carnagey Biological, 2006).

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The most recent assessment (Carnagey Biological, 2006; 2007), conducted in 2006 and 2007 as part of the current relicensing, sampled the LSR macroinvertebrate community at six locations downstream of Saluda Hydro. This study was conducted during the late-summer and early-fall months when D.O. levels were expected to be at their lowest levels and employed both the artificial substrate samplers used in previous assessments (Hester-Dendy multi-plate), as well as rapid bioassessment methods (Barbour et al., 1999). As in previous studies, regression analysis of the Hester-Dendy data suggested improved biotic conditions as distance from the Saluda Hydro dam increased during both 2006 and 2007. NCBI scores during the study generally ranged from “poor” immediately downstream of Project dam (TR) to “fair” to “good-fair” at the Oh Brother Rapids (OB) downstream near the Interstate 26 crossing. These results were not surprising, as studies have shown that operation of hydroelectric dams often results in decreased benthic diversity immediately downstream due to habitat instability associated with water level fluctuations and scour associated with increased water velocity (Carnagey Biological, 2006; 2007).

Because continuation of D.O. enhancement measures, turbine runner upgrades and implementation of minimum flows are likely to improve the aquatic habitats of the LSR, and because macroinvertebrates serve as an important bioindicator of aquatic health, state and federal agencies deemed it necessary to implement a long-term aquatic macroinvertebrate monitoring program as part of the CRSA. It is proposed within this program that the macroinvertebrate fauna of the LSR will be sampled for a period of two consecutive years following completion of each turbine runner upgrade. Sampling will occur at four locations in the LSR's mainstem: (1) the first cobble/gravel riffle downstream of the Project – Toenail Riffle (TN); (2) adjacent to Corley Island (CI); (3) the Ocean Boulevard shoal area (OB); and (4) adjacent to Riverbanks Zoo (ZO). Two of these sites (OB & ZO) are consistent with previous investigations on the LSR

Monitoring is proposed to be conducted bi-annually at each of the sample sites during each year of the two-year monitoring periods. Bi-annual sampling will consist of a spring sample coinciding with the period when D.O. levels are typically highest downstream of Project (March—April), as well as a late-Summer and early-Fall months (August—October) when downstream D.O. conditions are typically at their most critical. Additionally, bi-annual sampling will employ both the artificial substrate (Hester-Dendy) and multi-habitat sampling methods utilized in previous LSR studies.

Results obtained from each of the two-year macroinvertebrate monitoring periods will be summarized in a report and consultation will be initiated with state and federal resource agencies, as well as interested stakeholders. As such time that post-upgrade water quality assessments suggest that the site-specific D.O. standard for the LSR is being attained, SCE&G has proposed to initiate consultation with state and federal agencies to review macroinvertebrate monitoring to date and assess the need for additional monitoring and/or mitigative measures relative to macroinvertebrate fauna.

5.2.6 Diadromous Fish Monitoring

In anticipation of diadromous fish issues related to the upcoming Project relicensing, SCE&G hosted a meeting on November 10, 2004 with several state and federal resource agencies, NGOs and other stakeholders to identify issues that would need further studies. A diadromous fish study plan was subsequently developed and approved by the agencies on February 1, 2005. The purpose of the study was to document the relative abundance, distribution, and evidence of spawning of historically present diadromous fish species on the LSR and the Upper Congaree. Species targeted for study included the anadromous American shad, hickory shad, and blueback herring, and the catadromous American eel. A separate study plan was prepared that focused on shortnose sturgeon. During the 2005 and 2006 spring fish collections, no American shad, hickory shad, or blueback herring were collected. Furthermore, no larvae or juvenile diadromous fish were collected during ichthyoplankton sampling. No eels were captured during eel surveys or in the small eel ramp constructed at the Project. However, SCE&G and the SCDNR have captured American eels along the LSR during standardized fish collections. Furthermore, no adult

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or juvenile shortnose sturgeon, or eggs were collected while sampling with gill and ichthyoplankton nets.

5.2.7 Santee Basin Cooperative Accord (CRSA Appendix A-5)

Along with USFWS, SCDNR North Carolina Wildlife Resources Commission ("NCWRC"), and Duke Energy, SCE&G is a signatory and funder of the Santee River Basin Accord for Diadromous Fish Protection, Restoration, and Enhancement ("Accord"). While not a party to the Accord, SCDHEC attended and participated in many technical meetings as part of the Accord development process. The purpose of this Accord is to collaboratively address diadromous fish protection, restoration and enhancement in the Santee River Basin through implementation of a 10-year action plan. The Accord will remain in effect through the duration of the new license for the Project. As currently proposed, the Accord would fund a number of diadromous fish studies in the basin as part of the 10—year Action Plan, including five years of sturgeon research.

5.2.8 Fish Community Surveys (CRSA Appendix A-8)

Through the development of the CRSA, SCE&G has formalized the fish community sampling that has been conducted in the LSR since the mid-1990's. SCE&G will continue to conduct semiannual electrofishing sampling of the LSR to document and monitor for changes in the fish community. Details regarding this sampling are provided in Appendix A-8 of the CRSA.

6. Maintenance, Emergency Low Inflow Protocol (CRSA Appendix A-13)

Through meetings of the TWC, the participants determined that there was a need for a Maintenance, Emergency and Low Inflow Protocol (MELIP) for the Project. Subsequently, a MELIP was developed and filed with the CRSA. The MELIP was designed to work in coordination with the Normal Reservoir Operating Guidelines. Specifically, the MELIP is intended to provide operational guidance for abnormal operating situations caused by maintenance activities, emergency situations (including high inflow or flood events), and periods of sustained low inflow or drought conditions. As explained within the MELIP, to the extent practicable, SCE&G will avoid scheduling maintenance of Project structures or the hydro units that would impact the ability of SCE&G to release the required seasonal minimum flow or scheduled recreation flows, unless further damage would ensue or unscheduled maintenance would be required if the work is delayed. Scheduled drawdowns for maintenance activities normally occur during October through February; however, the time period may vary depending on the required scope of maintenance work. During emergency conditions, it may be necessary to operate the Project in such a manner that reservoir elevations and/or seasonal minimum or scheduled recreation flows cannot be maintained in the normal ranges, even during periods of normal inflow and hydrologic conditions.

During periods of time where SCE&G's Flow Forecasting Model indicates that the inflows to the reservoir will be high, SCE&G may need to take actions such as: reducing reservoir level below the existing target elevation in advance of, or during, the weather system to provide storage volume for the forecast inflow; operating one or more spillway gates to pass inflow in excess of that which can be passed by generation and prevent the reservoir from rising above el. 360.0' PD (358.5' NAVD88); allowing the reservoir to rise above the existing target elevation in order to store all or a portion of the inflow; making reasonable efforts to minimize downstream fluctuations in flow that may adversely affect habitat. Any of these actions may result in deviation from scheduled recreation flows and/or normal reservoir operation levels.

For operation during periods of sustained low inflow or drought, the MELIP defines trigger points and procedures for incremental reductions in seasonal minimum flow and downstream recreation flows based on gaged inflow to the Project. Although consensus was not reached on a MELIP reservoir trigger (trigger), in the interest of compromise and subject to all conditions contained in the CRSA, the signatories offered to accept either a 1 foot or 2 foot below target elevation trigger for implementation of the MELIP,

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as directed by the FERC. In the interest of developing a Comprehensive Settlement Agreement between all the parties, SCE&G proposed that the FERC make the final determination of a 1 or 2-foot trigger in implementing an MELIP. All signatories (although not a signatory, SCDHEC supported this approach) accept that this will be evaluated by the FERC as it conducts its analysis under the National Environmental Policy Act (NEPA). In the interest of moving the FERC relicensing process forward, signatories agreed to provide supporting data and/or justifications for either a 1 or 2 foot trigger or their justified alternative trigger to the FERC by September 22, 2009. This information is in addition to any other information that is filed in support of the NEPA process or any other applicable FERC hydroelectric licensing regulations. The Draft and Final FERC EA recommended a 2-foot trigger. SCDHEC also received comments requesting both 1 and 2-foot triggers as well as a 4-foot trigger requested by USFWS (see Section 7). Because the MELIP trigger is not a water quality issue and because minimum habitat requirements will be met regardless of which trigger is adopted, SCDHEC is of the opinion that either trigger would be consistent with requirements of the 401 Certification. As stated by the applicant, for the purposes of the 401 WQC process, the reservoir trigger at which point the MELIP will be implemented should be of no consequence since a 400 cfs minimum flow, which has been determined to be protective of all designated uses and aquatic flora/ fauna for the LSR has been established. The MELIP trigger only determines at what point a reduction in the target enhancement flows will occur.

During periods of normal inflow, SCE&G will operate the Saluda Project to maintain the reservoir level at or near the current target elevation within the proposed normal operating range of el. 354.0' Plant Datum (PD) to el. 358.0' PD, while providing the normal seasonal minimum downstream flow and normal scheduled recreation and safety training flows. If hydrologic conditions in the Saluda River basin draining to Lake Murray worsen and the 14 day average gaged inflow less estimated municipal usage ("net inflow") falls below the scheduled minimum flow release, water stored in Lake Murray will be used to augment Project inflow to provide the normal seasonal minimum flow until the reservoir level falls to more than (1 or 2 ft. TBD by FERC) below the current target elevation. At that time, SCE&G will discharge target minimum flow as follows:

14 Day Average Net Average Inflow	Target Flow (except April 1st – May 10th)
< 1,000 CFS	700 CFS minimum flow
< 700 CFS	500 CFS target flow with 400 CFS minimum flow

If 14 day average net inflow falls below the scheduled minimum flow during the April 1st through May 10th period when the striped bass enhancement flow regime is in effect (as described above in Section 4.1.7), reduced striped bass flows or continuous minimum flow will be implemented as follows, once the reservoir falls to more than (1 or 2 ft. TBD by FERC) below the current target elevation:

14 Day Average Net Inflow	Target Flow Provided April 1st – May 10th
< Striped Bass Flow Request	1,000 CFS minimum flow
< 1,000 CFS	700 CFS minimum flow
< 700 CFS	500 CFS target flow with 400 CFS minimum flow

If 14 day average net inflow should fall below the scheduled minimum flow between December 16 and January 17 (for the 1 ft Trigger), or between December 1 and February 1 (for the 2 ft. trigger), when the target reservoir elevation is within (1 or 2 ft. TBD by FERC) of el. 354.0' PD, the reservoir will not be required to drop (1 or 2 ft. TBD by FERC) below the current target elevation before reducing the minimum flow. Additionally, at any time during a low inflow period (when 14 day average net inflow is less than the scheduled minimum flow), should the reservoir level fall below el. 354.0' PD, the minimum flow from the Project will be reduced to a target flow of 500 CFS (400 CFS minimum), and will remain at that value

regardless of any increase of inflow until the reservoir level has risen above el. 354.0' PD.

During periods when the inflow falls below the scheduled minimum flow and the reservoir level is below the target elevation range, SCE&G will make reasonable efforts to conserve the remaining water stored in Lake Murray to achieve its goal of allowing the lake level to reach the guide curve and re-establish normal minimum flows. Details regarding MELIP implementation addressing recreational flows and Columbia Fire Department safety training are provided in the CRSA.

During extended periods of low inflow, when dropping the reservoir level below el. 350.0' PD appears imminent, SCE&G proposes to consult with the SCDNR, SCDHEC, USFWS, and other appropriate resource agencies to determine if further reductions in minimum flow below the target flow of 500 CFS (400 CFS minimum) should be considered. At that time, SCE&G will also coordinate a joint meeting with consulting agencies and the managers of the municipal water systems which withdraw water from Lake Murray, to consider potential drought management actions such as voluntary or mandatory water conservation measures, as determined by the agencies.

7. Public Comments Received and Summary of Comments

7.1 Comments received in response to SCDHEC's Public Notice

7.1.1 S. C. Department of Natural Resources (SCDNR)

Date: December 28, 2009

SCDNR believes implementation of provisions provided in the Comprehensive Relicensing Settlement Agreement (CRSA) will significantly enhance natural resources and their associated users in and around the Project. SCDNR has some concerns with the Water Quality Certification (WQC) Application. One concern is the clarity of some of the general information provided in the application. Another concern is that the CRSA did not fully resolve the maintenance, emergency and low inflow protocol (MELIP). SCDNR concurs with the need to reduce instream flow during a period of significant drought, but believes the 1-foot trigger recommended by the Applicant is too conservative in protecting reservoir storage at a cost to downstream users and resources.

SCDNR provided 12 comments regarding information in the Application to provide clarification including the goals of the Incremental Flow Incremental Methodology Technical Working Committee (IFIM TWC), Low Inflow Protocol (LIP) releases relating to the SCDNR boating navigation policy, minimum flow development, presentation of instream flow study results, meeting water quality standards at all flows, project influence outside of the project boundary, striped bass flows and 401 conditions, reservoir drawdowns, recommendation of a 2 -foot LIP trigger, continued trout growth and mortality studies, and cultural resources.

SCDNR provided the following recommendations for conditioning the (WQC):

1. Include the seasonal minimum flows as described in the CRSA.
2. Include the striped bass enhancement flows, as described in the CRSA along with language allowing for adaptive management as necessary.
3. Include a method to monitor the seasonal minimum flows and striped bass compliance flow.
4. Include a method to monitor the 500 cfs target flows implemented during an MELIP
5. Include a method to monitor and comply with the 400 CFS minimum flow implemented during an MELIP.
6. Include provisions of the CRSA to establish winter lake levels and the implementation of a drawdown program.
7. Ensure that all water quality standards are met at all levels of operation.

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7.1.2 U. S. Fish and Wildlife Service (USFWS)

Date: December 28, 2009

USFWS participated on several TWCs resulting in collaborative recommendations that are included in the license application and the CRSA. USFWS was unable to sign the CRSA for the project, but does support many of its elements. USFWS has entered into an agreement known as the Santee River Basin Accord (Accord) with SCE&G and others for diadromous fish restoration in the Santee River Basin, and are reserving their authority under section 18 of the Federal Power Act to prescribe fish passage at the Saluda Hydroelectric Project.

USFWS recommended that the 401 Water Quality Certification for the Project include conditions with the following requirements;

1. Meet and sustain water quality standards according to the proposed schedule in the CRSA.
2. Provide minimum flows in the LSR in accordance with the CRSA.
3. Implement a 4-foot LIP trigger.
4. Implement a drawdown program as proposed in the CRSA.
5. Implement the Freshwater Mussel Mitigation Plan provided by USFWS.
6. Provisions consistent with and identical to the Federal Power Act Section 18 Reservation of Authority for Fish passage.

7.1.3 Trout Unlimited (TU)

Date: December 18, 2009

TU requested that a public hearing be held to allow for additional comments from citizens and groups that have not been involved as stakeholders in the relicensing meetings. More input is needed to ensure that any water quality plans for the renewed FERC project license are representative of the community's wishes for the Lower Saluda River.

TU does not believe that the dissolved oxygen (D.O.) standard can be met by upgrading turbine runners and that the timetable for making needed venting or turbine improvements is much too drawn out. Oxygen injection should be required and implementation should be immediate. SCDHEC should require detailed plans for a proven solution, such as oxygen injection, with a timetable of no more than 3 years to complete needed renovations for the Saluda Hydro project. TU also stated that the effects of nitrogen supersaturation were not documented and that this kills fish. Such supersaturation is a key reason why air venting is not a viable method for meeting state D.O. standards all the time.

TU does not approve of the SCDHEC Classification and the D.O. Standards for the LSR because they do not support trout reproduction. SCDHEC should require that the water quality standards embrace the potential the river holds, not the current deficit condition. SCE&G's trout adaptive management plan should include studies to determine the suitability of possible trout reproduction and a reproducing trout population and to provide the needed conditions.

TU recounted the event of November 11 and 12, 2009 when SCE&G had to release unusually high flows due to large volumes of water coming into the lake during unseasonably high rain events. D.O. levels dropped to 1.1mg/l as reported by USGS gauges along with the readings of the high flows that produced the violation. SCE&G could have released surface water through their floodgates, which would have reduced or eliminated reduced levels of D.O. below state standards without water temperature complications, but the utility refused to do so. If venting is allowed, use of the spillway for lake level management, including flood control, must be required in the fall months when D.O. levels are less than 4.0 mg/l at the intakes so that the generators are not used beyond their capacity

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to maintain state standards. Any certification given should include provisions to require that SCDHEC levy the maximum fines allowed by state law for non-compliance violations.

7.1.4 Lake Murray Watch (LMW)

Date: December 28, 2009

LMW expressed concerns regarding impacts to lake littoral habitats if too much water is released downstream and stated that using a LIP trigger greater than 1 foot during periods of low inflows would likely have significant impacts to the lake's ecosystem. LMW requested that SCDHEC consider including SCE&G's proposal for a 1-foot LIP trigger as a condition in the 401 Water Quality Certification. LMW also submitted a letter from the Fishermen's Focus Group (FFG) addressed to the FERC (November 12, 2009). The FFG also expressed concern regarding the loss of littoral zone and supports the new lake guide curve that maintains the lake level close to the 358-foot target level from March 15 to August 31. FFG feels that this will provide significant enhancements to the aquatic resources. During periods of low inflow, FFC recommended that FERC consider a 6-inch lake level drop to trigger reductions in downstream habitat enhancement flows. If a 6-inch trigger is not possible, FFC requested that FERC approve SCE&G's proposal to use a 1-foot trigger.

7.1.5 Congaree River Keeper (CRK)

Date: December 23, 2009

CRK expressed concern over the event of November 11 and 12, 2009, when SCE&G had to release unusually high flows due to large volumes of water coming into the lake during unseasonably high rain events. This caused D.O. levels to drop to 1 mg/l well below the minimum of 4 mg/l. This prolonged period of low D.O. in the Lower Saluda river likely caused fish kills and had a significant impact on other aquatic organisms in the river.

CRK stated that until the upgrades can be made, SCE&G must adjust its operations to eliminate the occurrence of D.O. violations that may occur prior to the installation of new upgraded units. Using the spillway to mix oxygenated surface water with poorly oxygenated water from lake depths should be explored as a temporary option until D.O. excursions are eliminated. Another alternative to prevent D.O. violations would be to temporarily limit capacity of water being discharged through the dam during the late summer/fall months when the potential for D.O. violations are present (e.g., Instead of discharging 18,000 cfs for 10 hours, discharge 9,000 cfs for twice as long). CRK requests that SCDHEC require, as a condition of its 401 Certification, that SCE&G submit a plan detailing how it will modify its operations to avoid situations like that, which occurred on November 11-13, and if such a situation cannot be avoided, how it will minimize the impact of releases of oxygen depleted water downstream. SCDHEC should require SCE&G to make every effort to comply with water quality standards 100% of the time.

If unit upgrades bring the project into compliance with D.O. standards, DHEC must impose another solution or action that would serve as a motivating factor for solving the D.O. problem.

7.1.6 Marion Douglass

Date: November 16, 2009

Ms. Douglass owns property on the lake, spends most weekends there, and enjoys the beauty, fishing, boating, and the friendly neighbors. She found SCE&G personnel to be professional, courteous and helpful. She is confident they will remain diligent in their operation of the Hydroelectric Project.

7.2 Public Informational Hearing

A Public Informational Hearing (Hearing) was held at Saluda Shoals Park on March 11, 2010 in response to TU's request. Oral comments were recorded and written comments were received for a period of 15 days after the Hearing, as follows:

7.2.1 Ms. Rebecca Connelly

Ms. Connelly spoke at the hearing and stated that the Saluda River has been designated as a scenic river, but that has recently been listed the number six highest river in danger due to its water equality. She also expressed concern regarding the direct release of water from Lake Murray to the Saluda River during certain times when oxygen levels are low creating a dead zone for fish in the river. Ms. Connelly acknowledged that some actions have been taken to remedy water quality problems, but she is concerned about when actions are actually to take place and recommends a better defined action plan with a better time frame for that action. Ms. Connelly also supports SCDNR comment

7.2.2 Mr. Dave Landis

Mr. Landis spoke as a representative of the **Lake Murray Association (LMA)**. Mr. Landis stated that LMA supports SCE&G's request that the FERC accept the 1-foot below target elevation as a trigger for the implementation of the MELIP. Mr. Landis responded to the comment that commercial docks are usable at the 350 level and that the licensee has sited private docks to allow access at the 352 level. LMA's survey indicates that 48% percent of the docks are not usable at the 354 level and the number of unusable docks should rise considerably at the 352 level. Finally, Mr. Landis stated that the new minimum flows are much higher than in the past, particularly the striped bass flows. In severe drought conditions no LIP trigger will stop the lake from receding. What SCE&G is attempting to do is to conserve water for as long as possible for maintaining adequate flows in the downstream habitat.

7.2.3 American Rivers and Coastal Conservation League (AR/SCCCL)

Date: March 11, 2009 (sic)

AR/SCCCL provided written comments during the comment period following the Public Informational Hearing. AR/SCCCL summarized their participation in the relicensing process and acknowledged the positive aspects of the CRSA, which they signed. AR/SCCCL encouraged SCDHEC to incorporate all portions of the settlement (CRSA) necessary to reasonably assure the protection and enhancement of beneficial uses and address issues not addressed by the settlement terms. In addition AR/SCCCL provided the following comments:

- ☐ The 3-11-year schedule for meeting the D.O. standard 100 percent of the time must be included in the 401.
- ☐ Congaree National Park (CNP):
AR/SCCCL stated that many of the goals of the Ecologically Sustainable Water Management Plan (ESWM) can be met through the flow schedule in the CRSA. AR/SCCCL also stated that SCE&G has refused to acknowledge the benefits the settlement flows will bring to the CNP. The 401 Certification should set forth limitations, conditions, or monitoring requirements necessary to address project impacts on the unique habitat of Congaree National Park.
- ☐ Recreational Use Protection:
AR/SCCCL expressed concern regarding safety issues associated with the great variability of flows in the LSR. SCDHEC recreation narrative standard "suitable for primary and secondary
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contact recreation” has only applied to water chemistry in the past. AR/SCCCL asked that SCDHEC assure that the LSR is suitable for recreation by requiring, in the 401 Certification, the proposed system of lights, sirens, call down systems, etc. in the proposed Safety Program to address the danger inherent in project operations.

- ❑ The 401 Certification should require a 2-foot LIP trigger rather than letting the FERC decide.
- ❑ Freshwater Mussels and Shortnose Sturgeon:
Project operations effects on temperature are responsible for the fact that no freshwater mussels were found in the LSR. Studies also show that no shortnose sturgeons were found in the LSR despite their presence in the Congaree River. The effects of temperature on freshwater mussels and shortnose sturgeon should be accounted for in the 401 Certification.

8. Conclusion on Water Quality Impacts and Classified Uses

When evaluating the proposed work, SCDHEC followed procedures for implementing State 401 Water Quality Certification regulations pursuant to Section 401 of the Clean Water Act, 33 U.S.C. Section 1341, the requirements of Regulation 61-101, Water Quality Certification. Previous sections of this staff assessment have provided a description and evaluation of specific project impacts to jurisdictional waters, and measures necessary to ensure that the proposed work improve water quality to support water quality standards and classified uses.

8.1 Evaluation and Responses to Comments

The following analysis will address concerns raised by resource agencies or other commenting parties in the previous section:

8.1.1 Water Quality

Trout Unlimited (TU) and Congaree River Keeper (CRK) expressed concerns regarding D.O. violations, particularly the event of November 11 and 12, 2009, when SCE&G had to release unusually high flows due to large volumes of water coming into the lake during unseasonably high rain events. This caused D.O. levels to drop to 1 mg/l well below the minimum of 4 mg/l. CRK assumed that this prolonged period of low D.O. in the Lower Saluda River likely caused fish kills and had a significant impact on other aquatic organisms in the river and TU stated that fish kills have occurred as an annual occurrence. TU and CRK suggested that SCE&G could have released surface water through their floodgates, which would have reduced or eliminated reduced levels of D.O. below state standards without water temperature complications. CRK suggested that another alternative to prevent D.O. violations would be to temporarily limit capacity of water being discharged through the dam during the late summer/fall months when the potential for D.O. violations are present (e.g., Instead of discharging 18,000 cfs for 10 hours, discharge 9,000 cfs for twice as long). CRK requests that SCDHEC require, as a condition of its 401 Certification, that SCE&G submit a plan detailing how it will modify its operations to avoid these situations. If such a situation cannot be avoided, how will SCE&G minimize the impact of releases of oxygen depleted water downstream? SCDHEC should require SCE&G to make every effort to comply with water quality standards 100% of the time. However, utilization of the spillway is not an appropriate course of action due to a number of safety, regulatory and environmental factors, one of which is in direct conflict with TU goals, *i.e.*, a healthy, reproducing, self sustaining population of trout. Opening the spillway poses the very real potential for thermal impacts to downstream resources, and as discussed above, temperature, not D.O., is the more problematic issue in regards to the health of the trout population. In addition, SCE&G must be responsive to the concerns of the Public Service Commission (PSC), which holds SCE&G accountable for generating and providing electricity to its customers as economically as reasonably possible. From a purely economic regulation perspective, water spilled and not used in the generation of power is considered a waste of low cost energy and drives up the system energy costs, since the lost energy must be replaced by electricity from other sources, all of which are less economic and nearly all of which are

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much less environmentally benign. The radial spillway taintor gates will not release surface waters, as assumed. If the gates were in the up position they would release water approximately 20 feet below the normal maximum operating water level of el 358 PD (356.5 NAVD 88). Regarding fish kills, the applicant stated that large events would doubtless have been documented.

TU does not believe that the D.O. standard can be met by upgrading turbine runners and that the timetable for making needed venting or turbine improvements is much too drawn out. Oxygen injection should be required and implementation should be immediate. SCDHEC should require detailed plans for a proven solution, such as oxygen injection, with a timetable of no more than 3 years to complete needed renovations for the Saluda Hydro project. However, the current turbine venting program and use of Look Up Tables (LUT's) already has provided D.O. levels in the LSR to the point that the LSR meets the state standards nearly 100 % of the time. Based on a 2008 operating report, releases from Saluda Hydro met the State water quality guideline for dissolved oxygen 99.65% of the time in 2008. In fact, recent historical D.O. levels in the LSR have risen to the point that the water body is no longer listed as "impaired" by the SCDHEC. The new aerating runner technology is proven technology and its Installation will enhance the already highly effective current turbine-venting program at Saluda Hydro. Hydroelectric projects similar to Saluda Hydro, such as the Osage, J Strom Thurmond, and Catawba/Wateree Projects, are equipped with aerating runners and have dependably and reliably increased D.O. levels in releases to assist those associated rivers in meeting State D.O. standards. The exact amount of air that will be entrained will not be known until modeling conducted by the turbine vendors is made available. However, as experienced at the above referenced projects, airflows into the units will likely double to quadruple in volume and create highly oxygenated conditions in the releases from Saluda Hydro. Unit 5 is the largest and least efficient aerating runner as it sits below tailwater during full generation. Under the terms of the Comprehensive Relicensing Settlement Agreement (CRSA), Unit 5 will be upgraded first and it is anticipated that an immediate positive improvement in D.O. levels under all operating conditions, including full Project capacity, will be realized. Regarding a 3-year timetable, an accelerated schedule as suggested by TU could have a very serious impact on public safety by requiring SCE&G to have more than one unit out of service for an extended period of time while trying to maintain the new guide curve which requires higher lake levels throughout the year. The schedule for Project upgrades was developed with State and federal agencies and numerous non-governmental organizations and was endorsed by those entities. Although TU does not concur with the proposed upgrade schedule, SCDHEC believes those responsible for development of the schedule objectively evaluated all pertinent information and were best suited to make a final recommendation on this matter.

TU also stated that the effects of nitrogen supersaturation were not documented and that this kills fish. Such supersaturation is a key reason why air venting is not a viable method for meeting state D.O. standards all the time. However, there is no evidence to suggest that supersaturated conditions have existed in the LSR. Turbine venting has been implemented successfully since 1999 and no fish kills either from low D.O. levels or nitrogen super saturation in the LSR have been documented. The SCE&G's Corporate Environmental Services Department, routinely monitors Total Dissolved Gasses (TDG), which is an indicator of the level of nitrogen saturation during the low D.O. season. Although no TDG standard exists for the LSR, when the vents are first opened during the summer, they are opened 50% and TDG levels are checked to ensure that they do not exceed 110% of the atmospheric pressure. As D.O. levels further decrease the vents are opened to the 100% position. At the end of the low D.O. season (after autumnal lake mixing, or "turnover") the vents are closed in two stages (50% and 100%) to ensure that TDG levels do not exceed 110% of atmospheric pressure. Installation of aerating turbine runners as proposed at Saluda Hydro have been proven to provide improvements to D.O. downstream of hydroelectric projects without creating nitrogen super-saturated river conditions.

TU does not approve of the SCDHEC Classification and the D.O. Standards for the LSR because they do not support trout reproduction. SCE&G's trout adaptive management plan should include studies to determine the suitability of possible trout reproduction and a reproducing trout population and to provide the needed conditions. SCDHEC has designated the LSR as Trout Waters - Put Grow and Take (see Section 5.2.3). The 401 Water Quality Certification serves to protect and maintain this designated use. A TPGT designation

signifies that trout populations can only be sustained through stocking programs such as the one the SCDNR currently has in place for the LSR. Natural Trout Water (NTW) designations (and associated 6.0 mg/l D.O. standard as referenced by TU) reflect waters in which trout populations may be maintained and supported through natural reproduction. These NTW's and associated watersheds are typically in higher elevations where water temperatures naturally fall within the ranges supporting trout reproduction and survival, heavily buffered, unaffected by man's activities, protected in National Forests, and/or in relatively pristine condition. As a consequence, in South Carolina, all waters with a NTW designation are restricted to headwater streams in mountain areas of the state. During relicensing, significant effort was made to evaluate trout reproduction possibilities in the LSR. The Fish and Wildlife Technical Working Committee (TWC) conducted a comprehensive analysis of the water quality and the habitat for rainbow and brown trout in the LSR, including spawning criteria, to determine if trout reproduction was likely to occur even with increased D.O. levels in the LSR. The findings of the report conclude that the LSR is unlikely to support significant, if any, reproduction and extremely unlikely to support a self-sustaining fishery. This is due to a number of factors having nothing to do with D.O. levels, such as the following spawning and nursery habitat insufficient to allow for recruitment to compensate for mortality; limited survivorship of potential spawning adults to age 2 and above [possibly due to a variety of biotic and abiotic factors including predation, competition, angling exploitation and environmental conditions]; marginal spawning and incubation water temperature (brown trout); limited amount and quality of gravel spawning beds for both species; and discontinuous and limited fry and juvenile nursery habitat. When consideration of these physical impediments is taken into account, it becomes abundantly clear that TU's assertion that D.O. levels in the LSR are the limiting factor to trout reproduction is a gross exaggeration. Nevertheless, recognizing interests among stakeholders to enhance an already successful trout fishery, SCE&G, as a mitigation alternative, developed a Trout Evaluation and Monitoring Program (TEMP) for the LSR. This program, developed by the TWC, is designed to provide useful information and to serve as a tool available to assist regulatory agencies in managing this resource to ensure longevity of the TPGT designated use for the LSR

CRK stated that if unit upgrades do not bring the project into compliance with D.O. standards, DHEC must impose another solution or action that would serve as a motivating factor for solving the D.O. problem. However, SCE&G is committed to making improvements to D.O. levels in releases from Saluda Hydro to support SCDHEC water quality standards. SCE&G has not ruled out any options (including installing a combination of aerating runners with oxygen injection) to improve D.O. levels at the Project. SCE&G will evaluate turbine vendor performance specifications and if it is determined that the most effective and most economical approach is to utilize oxygen injection technology then SCE&G may in fact do so. However, until proposals containing performance specifications have been received and evaluated, SCE&G cannot commit to a specific technology. Also, it is noted within the CRSA that "after all unit upgrades and testing have been completed, if Saluda Hydro operations do not support the South Carolina lower Saluda River site specific D.O. standard, SCE&G will meet with SCDHEC and CRSA signatories within one year after the final unit upgrade and testing has been completed to develop a plan to assure future support of the standard".

Ms. Rebecca Connelly commented at the SCDHEC Public Hearing that that the LSR was listed just this year as the 6th highest river listed in danger by American Rivers (AR). Ms. Connelly seems to have misunderstood the listing and designation by AR. The listing referenced by Ms Connelly refers to threats to the upper Saluda River (upstream of Lake Greenwood) from point and non-point sources of phosphorus pollution which has nothing at all to do with the LSR or relicensing of the Saluda Hydroelectric Project. While SCDHEC understands that phosphorous removal may have benefits for the entire basin, it is completely out of SCE&G's control and scope of the relicensing of Saluda Hydro. The second item Ms. Connelly references is associated with DO levels during Project operations and that a defined plan(s) be developed to address this. As noted many times, SCE&G has proposed to upgrade project turbines and equipment within a 3 – 11 year time frame. It is SCE&G's goal to install the necessary equipment to ensure that D.O. levels in the LSR meet the site specific standards.

Other commenters including USFWS and AR/SCCCL recommended that the proposed 3 to 11-year schedule

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for upgrades to consistently meet the D.O. standard, as proposed in the CRSA, be required (see conditions in Section 10.).

8.1.2 Minimum Flows in the LSR

Commenters including SCDNR and USFWS recommended that the 401 WQC require implementation of minimum flows, including striped bass flows, in the LSR as proposed in the CRSA (see conditions in Section VI.). SCDNR also recommended that methods be developed to monitor all minimum flow requirements, including Maintenance, Emergency Low Inflow Protocol (MELIP) flows, for compliance purposes. To address this concern, an Operation and Compliance Monitoring Plan (OCMP) was proposed as a draft License Article 423 (Attachment A). Contained within that draft license article are provisions to develop methods for monitoring reporting and demonstrating compliance with seasonal minimum, target and striped bass flows. Preparation of the OCMP will undoubtedly require consultation with SCDHEC and federal resource agencies prior to submittal to the FERC for review and approval (see conditions in Section 10.).

8.1.3 Maintenance, Emergency Low Inflow Protocol (MELIP) Trigger

A discussion of the MELIP trigger issue is provided in Section 6. (Maintenance, Emergency Low Inflow Protocol) of this assessment. Commenters including SCDNR and AR/SCCCL requested that the 401 WQC require a 2-foot trigger. USFWS requested that the 401 WQC require a 4-foot trigger. Commenters including Lake Murray Watch and Lake Murray Association asked that SCDHEC consider requiring a 1-foot trigger. SCE&G requested a 1-foot trigger and stated that their primary goal in designing the MELIP was to provide for an equitable distribution of the impact of low inflow periods between the reservoir and the LSR. The measure of equitability used in the SCE&G analysis was to compare the percent of target minimum flow volume released annually with the percent of target active reservoir storage achieved annually. Commenters asking for 2 and 4-foot triggers do not agree with this, as they have noted that a reduction in flows to the river has a greater environmental significance than similar reductions in the lake storage levels. SCE&G contends that the results from its modeling demonstrate that the 1 foot LIP trigger provides a more equitable division of impact than either a 2 or 4-foot MELIP trigger. The enhancements to the reservoir's aquatic resources and recreational values from the proposed guide curve will be reduced if a 2 foot MELIP trigger is implemented, especially during prolonged low inflow periods. As stated earlier, the lowest downstream flows proposed under the LIP will still be protective of the LSR's aquatic resources (see Section 5.2.1. Minimum Flows for the Lower Saluda River). In addition, the target MELIP flow (500 cfs) will address navigation concerns expressed by SCDNR. As discussed in Section 6., SCDHEC supports the provision in the CRSA that the FERC make the decision regarding the MELIP trigger. Because the MELIP trigger is not a water quality issue and because minimum habitat requirements will be met regardless of which trigger is adopted, SCDHEC is of the opinion that either trigger would be consistent with requirements of the 401 Certification. The FERC indicated in the final Environmental Assessment (EA) for the Saluda Hydroelectric Project that a 2-foot MELIP trigger would be most equitable in balancing Lake Murray and LSR resources and uses.

8.1.4 Lake Murray Drawdowns

Periodic Lake drawdowns are discussed in Section 4.2.1.3. (Increasing Target Winter Minimum Pool Levels for Normal Operations of Lake Murray and Implementation of a Drawdown Program). Commenters including SCDNR and USFWS, requested that the 401 WQC require these drawdowns in accordance with the CRSA (see conditions in Section 10.).

8.1.5 American Rivers and SC Coastal Conservation League (AR/SCCCL) comment addressing the Congaree National Park

AR/SCCCL stated that R. 61-101 says a certification must be denied if the proposed activity adversely impacts special or unique habitats. The flows from the Saluda make up roughly a third of the total flow to Congaree National Park (CNP). CNP is South Carolina's only National Park and represents more than 20,000 acres of the most diverse bottomland hardwood forest in the world. CNP has been named an International Biosphere Reserve and an internationally important bird area. The health of this world class floodplain forest is determined by the frequency, magnitude, and duration of flooding, which is partially controlled by the Saluda

dam upstream. These seasonal high flows are critical to fish species such as striped bass, American shad, and blueback herring. AR/SCCCL have been active in the process to develop an Ecologically Sustainable Water Management Plan (ESWM) for the Saluda and Congaree rivers, which is a part of the record for this proceeding, and believe that many of ESWM goals for CNP can be met through the flow schedule in the settlement, often referred to as "Striped Bass Flows" (herein "settlement flows"). A Certification should set forth limitations, conditions, or monitoring requirements necessary to address project impacts on the unique habitat of Congaree National Park.

However, study of the data developed during the relicensing proceeding has found no evidence that operation of Saluda Hydro has any impact on the aquatic habitats within the Congaree National Park (CNP), which lies some 25 miles downstream of the Saluda Dam. Data do suggest that flows in the LSR, under certain conditions, may provide up to 1/3 of the flow in the Congaree River. However, flow releases solely from Saluda Hydro do not achieve levels sufficient to inundate the CNP. Flooding conditions (approximately 30,000 cfs +) in the Broad River are necessary to overtop the earthen embankment levees at the CNP. Therefore, only when the Broad River is at or very near flood stages do flow releases from Saluda Hydro begin to make any difference within the CNP.

The "Striped Bass Flow" proposal contained in the CSRA was developed strictly through the Saluda Hydro Relicensing Process. During the relicensing process, technical data were presented to the Instream Flow Technical Working Committee (IFIM TWC) regarding impacts that operation of Saluda Hydro may have on striped bass habitat in the Congaree River. Based on data presented by the South Carolina Department of Natural Resources, it was concluded that there may be some correlation between releases from Saluda Hydro and the effects on the reproductive success of striped bass in the Congaree River. Therefore, after extensive evaluation and discussion, SCE&G agreed to include the Striped Bass Flow Program (Program) as part of the CSRA. This Program was founded on data which suggests these flows may improve striped bass populations in the Congaree River. Recognizing that the striped bass flows represent less than 10% of those flows which are required to overtop the earthen embankments at the CNP, it seems unlikely that these flows would have significant inundation benefit to the CNP. Therefore, SCDHEC will not require conditions, limitations and monitoring to address this issue.

8.1.6 AR/SCCCL comment addressing Recreational Use Protection

AR/SCCCL stated that the great variability in flows in the Saluda creates safety concerns when flows go from 400 cfs to 20,000 cfs in under 15 minutes. At Saluda Shoals Park, one of the heaviest use areas on the river, the water can rise more than a foot a minute. AR/SCCCL was concerned that a river that rises 10 feet in less than 15 minutes with no warning on most of the river, creates the substantial possibility of injury to life and property is not safe for primary and secondary contact recreation. Several River users have drowned during rising water and more have been stranded. In past instances, the Department has interpreted the narrative standard of "suitable for primary and secondary contact recreation" as only applying to water chemistry. In this particular situation, SCDHEC is being asked to certify that the danger inherent in project operations that create a rapid 10-foot water level increase is suitable for recreation.

AR/SCCCL further stated that the Recreation RCG has designed an adaptive Safety Program that will make the lower Saluda one of the safest urban rivers in the country, with 51 days of recreation flows that are protected from sudden increases in water levels. This system of lights, sirens, call down systems, public education, and recreational flow releases insures that the lower Saluda is suitable for recreation and should be incorporated into the 401 Certification under 61-101 (5) (a) and (c).

Regulation 61-101 (5) (a) and (c) does indeed state the objective that waters be maintained as suitable for recreational **contact** and this suitability for recreation standard applies to water quality (fecal coliform bacteria). SCDHEC believes that the AR/SCCCL suggestion that primary and secondary recreational "contact" pertains to factors beyond water quality is without merit and breaches the regulatory confines of the 401 WQC process. SCDHEC's interpretation of what is suitable for "recreational contact" does not extend beyond water quality. In addition, such an action would impair SCE&G's ability to respond promptly and effectively to changes in safety requirements as may be directed by the Commission.

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8.1.7 AR/SCCCL comment addressing Freshwater Mussels and shortnose Sturgeon AR/SCCCL stated that evidence on the record demonstrates that no freshwater mussels were found in the lower Saluda River. Project operations effects on temperature in the river have apparently wiped out this entire Taxa of indigenous species. Relicensing studies show that no shortnose Sturgeon were found in the Saluda River, despite their presence in the Congaree River. The effects of temperature on freshwater mussels and shortnose Sturgeon is [sic] not addressed by the settlement and should accounted for in the 401 certification.” However, the effects of continued operation of the Saluda Hydro Project on Sturgeon and Mussels are addressed through the Shortnose Sturgeon Management Program and Mussel Restoration Program contained as part of the CRSA. These programs were developed through extensive consultation with non-governmental organizations (including AR/SCCCL) and those resource agencies responsible for management of these species. Implementation through adaptive management of these programs in cooperation with State and Federal resource agencies will fully address and allow for protection, mitigation and enhancement of these aquatic species and does not need to be conditioned under 401. These programs and any modifications imposed by FERC will be conditioned in the new license with compliance administered by the FERC.

8.1.8 USFWS comment regarding its Freshwater Mussel Mitigation Plan

USFWS recommended that the licensee mitigate for the impacts of the operation of the Project to freshwater mussel populations in the Lower Saluda River and the Congaree River. The Service recommends the Freshwater Mussel Mitigation Plan for the Lower Saluda River and Congaree River it provided be included as a condition of any §401 WQC for the Saluda Hydroelectric Project. However, the applicant's *Lower Saluda River Freshwater Mussel Adaptive Monitoring and Restoration Program* (MAMRP) is part of the overall mitigation package contained in the CRSA. The USFWS's *Freshwater Mussel Mitigation Plan* has many elements in common with the MAMRP included with the Saluda Hydro CRSA including the following:

1. Comprehensive Baseline Survey of the Congaree River
2. Tagging
3. Translocation
4. Propagation
5. Monitoring including Savannah Lilliput Surveys

The MAMRP proposed by SCE&G is consistent with the plan developed by USFWS. It should be recognized that none of the mussel species known to occur in the Congaree River are federally listed as threatened or endangered. As these species are not federally listed, management of these resources remains the responsibility of the SCDNR, as stated on page 4 of SCDNR's letter to the FERC dated September 29, 2009. Because SCDNR retains this management responsibility, it would be more appropriate to proceed with the existing *Saluda River Freshwater Mussel Adaptive Monitoring and Restoration Program*, which has been approved by the SCDNR through signing of the CRSA.

8.1.9 USFWS recommendation that provisions identical with Reservation of Authority for Fish Passage (Federal Power Act Section 18) be included in any 401 WQC

USFWS recommended that SCDHEC include provisions consistent with and identical to the Reservation of Authority for Fish Passage (Federal Power Act Section 18) in any 401 WQC issued for the Saluda Hydroelectric Project. However, SCDHEC does not find it necessary to require, as a condition of the 401 WQC, authority already granted to the USFWS under Section 18 of the Federal Power Act. Section 18 Reservation Authority is addressed in the Santee Basin Cooperative Accord (Accord), which SCE&G signed. SCE&G's participation in the Accord is conditioned in this assessment (see Section 10).

8.2 Final Conclusion

SCDHEC has reasonable assurance that the water quality standards of Regulation 61-68 and Regulation 61-69 will not be contravened per the unit upgrade schedule specified in the CRSA Appendix A Section 4.1. The proposed activity will result in no significant degradation to the aquatic ecosystem or remove existing and classified uses of Lake Murray and the Lower Saluda River and is in compliance with the above regulations provided the applicant adheres to the conditions in Section 10. The above assessment also ensures that the

Project will be operated in a manner that will enhance water quality and aquatic resources affected by the project. Information about the technical aspects of this application is available from Mark Giffin, the project manager, by calling 803-898-4179 or by e-mailing giffinma@dhec.sc.gov.

SCDHEC reserves the right to impose additional conditions on this Certification/Permit to respond to unforeseen, specific problems that might arise and to take any enforcement action necessary to ensure compliance with State water quality standards.

9. Staff Recommendation

Issue 401 Water Quality Certification with conditions.

10. Conditions to be Placed on Water Quality Certification When Issued

1. Minimum flow releases to the LSR, with adaptive management provisions, must be in accordance with CRSA Appendix A-11 (Project Flow Release Program).
2. SCE&G must develop in consultation with SCDHEC, an Operation and Compliance Monitoring Plan (OCMP) as conditioned in any FERC License issued for the Project. The plan must address methods to monitor and comply with required minimum flows established in the CRSA Appendix A-11 (Project Flow Release Program).
3. SCE&G must meet the D.O. standard in the LSR under all operating levels and conditions by implementing the turbine upgrade schedule in CRSA Appendix A Section 4.1. If the proposed unit upgrades do not support the SCDHEC LSR site specific DO standard, SCE&G must meet with SCDHEC and CRSA signatories within one year after the final unit upgrade, and completion of performance testing, to develop a plan to assure future support the standard.
4. During periods of normal inflow, the project must be operated in accordance with the proposed Normal Reservoir Operating Guidelines (CRSA Appendix A-14) except for provisions in Condition 5.
5. Lake Murray drawdowns to address lake water quality and other factors must be conducted, with adaptive management provisions, in accordance with the Reservoir Drawdown Program (CRSA Appendix A-12).
6. SCE&G must implement the Rare, Threatened and Endangered Species Management Program (CRSA Appendix A-9) and the Sturgeon Protection and Adaptive Management Program (CRSA Appendix A-6) and any modifications to these Programs contained in the FERC license under ESA consultation requirements.
7. During periods of low inflow, the project must be operated in accordance with the proposed Maintenance, Emergency, and Low Inflow Protocol (CRSA Appendix A-13).
8. To support and enhance aquatic communities in the project area, SCE&G must implement the Trout Evaluation and Monitoring Program (CRSA Appendix A-7), Freshwater Mussel Enhancement Program (CRSA Appendix A-4), LSR Benthic Macroinvertebrate Monitoring and Enhancement Program (CRSA Appendix A-3), Lower Saluda River Fish Community Monitoring Program (CRSA Appendix A-8) and any modifications to the Programs recommended by the FERC.
9. SCE&G must continue to participate as provisioned by the terms of the Santee River Basin Accord for Diadromous Fish Protection, Restoration, and Enhancement (CRSA Appendix A-5).

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11. References

South Carolina Department of Health and Environmental Control. Regulation 61-68, Water Classifications and Standards. Code of Laws of South Carolina, 1976, as amended. 22pp.


South Carolina Department of Health and Environmental Control. Regulation 61-69, Classified Waters. Code of Laws of South Carolina, 1976, as amended. 36pp.

South Carolina Department of Health and Environmental Control. Regulation 61-101, Water Quality Certification. Code of Laws of South Carolina, 1976, as amended. 8pp.

South Carolina Department of Health and Environmental Control. 2010 Integrated List.

South Carolina Department of Health and Environmental Control. Watershed Water Quality Management Strategy; Saluda River Basin. Technical report No. 004-04.

Prepared by:  Date: 9-21-10

Reviewed & Approved by:  Date: 9/22/10

